Question Paper Name:	PGD BIG DATA AND PHD Computaional Biology TRACK 1 30th May 2019 Shift 1 Set1
Subject Name:	PGD BIG DATA AND PHD Computaional Biology TRACK 1
Creation Date:	2019-05-30 13:50:38
Duration:	180
Total Marks:	100
Display Marks:	Yes
Share Answer Key With Delivery Engine:	Yes
Actual Answer Key:	Yes

PGD BIG DATA AND PHD Computaional Biology TRACK 1

Group Number :	1
Group Id :	128206194
Group Maximum Duration :	0
Group Minimum Duration :	120
Revisit allowed for view? :	No
Revisit allowed for edit? :	No
Break time:	0
Group Marks:	100

Part-A

Section Id :	128206527
Section Number :	1
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	15
Number of Questions to be attempted:	15
Section Marks:	30
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	128206526
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 12820611376 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Median and Mode are

(A) Measures of deviation

(B) Ways of sampling

(C) Measures of control tendency

(D) None of the above

Options :

12820644951. A

12820644952. B

12820644953. C

12820644954. D

Question Number : 2 Question Id : 12820611377 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Research is

(A) Searching again and again

(B) Finding solution to any problem

(C) Working in a scientific way to search for truth of any problem

(D) None of the above

Options :

12820644955. A

12820644956. B

12820644957. C

12820644958. D

Question Number : 3 Question Id : 12820611378 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Which of the following variables cannot be expressed in quantitative terms?

(A) Socio-economic Status

(B) Marital Status

(C) Numerical Aptitude

(D) Professional Attitude

Options :

12820644959. A

12820644960. B

12820644961. C
12820644962. D

Question Number : 4 Question Id : 12820611379 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

In the process of conducting research 'Formulation of Hypothesis' is followed by

(A) Statement of Objectives

(B) Analysis of Data

(C) Selection of Research Tools

(D) Collection of Data

Options :
12820644963. A
12820644964. B
12820644965. C
12820644966. D

Question Number : 5 Question Id : 12820611380 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The eigen values of a skew-symmetric matrix are

(A) Always zero

(B) Always pure imaginary

(C) Either zero or pure imaginary

(D) Always real

Options :
12820644967. A
12820644968. B
12820644969. C
12820644970. D

Question Number : 6 Question Id : 12820611381 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

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t of linear equations is represented by the matrix equation $Ax = b$. The necessary condition for the existence of a solution for this system is

(A) A must be invertible

(B) b must be linearly depended on the columns of A

(C) b must be linearly independent of the columns of A

(D) A must be singular

Options :

12820644971. A

12820644972. B

12820644973. C

12820644974. D

Question Number : 7 Question Id : 12820611382 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Let $\{N(t), t \in [0,\infty)\}$ be a Poisson process with rate $\lambda = 0.5$. The probability of no arrival in (3,5] is

(A) 0.37
(B) 0.10
(C) 0.89
(D) 0.54

Options :

12820644975. A

12820644976. B

12820644977. C

12820644978. D

Question Number : 8 Question Id : 12820611383 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The area enclosed between the parabola $y = x^2$ and the straight line $y = x$ is

(A) 1/8
(B) 1/6
(C) 1/3
(D) 1/2

Options :

12820644979. A

12820644980. B

12820644981. C

12820644982. D

Question Number : 9 Question Id : 12820611384 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

of the reaction is equal to the product of three factors listed below except
(A) Collision frequency
(B) Energy factor
(C) Orientation factor
(D) pH factor

Options :
12820644983. A
12820644984. B
12820644985. C
12820644986. D

Question Number : 10 Question Id : 12820611385 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Which is not a type of catalyst:
(A) Positive catalyst
(B) Negative catalyst
(C) Autocatalyst
(D) homogeneous catalysis

Options :
12820644987. A
12820644988. B
12820644989. C
12820644990. D

Question Number : 11 Question Id : 12820611386 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

How many protons does the nucleus of an atom of element with atomic number 6 contain ?

(A) 2

(B) 3

(C) 6

(D) 5

Options :
12820644991. A
12820644992. B
12820644993. C
12820644994. D

Question Number : 12 Question Id : 12820611387 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

s of the substance (m) and its volume (V) are

(A) intensive properties
(B) state functions of the system
(C) thermodynamic properties
(D) extensive properties

Options :

12820644995. A

12820644996. B

12820644997. C

12820644998. D

Question Number : 13 Question Id : 12820611388 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The main source of energy for the human's organism is

(A) ATP
(B) carbohydrates
(C) proteins
(D) vitamins and minerals

Options :

12820644999. A

12820645000. B

12820645001. C

12820645002. D

Question Number : 14 Question Id : 12820611389 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

When the value of rate constant and rate of reaction are equal?

(A) reaction take place in homogeneous system
(B) reaction take place in heterogeneous system
(C) concentrations of reactants are equal to 1 mol/L
(D) concentrations of reactants are the same, but not equal to 1 mol/L

Options :

12820645003. A

12820645004. B

12820645005. C

12820645006. D

Question Number : 15 Question Id : 12820611390 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Which of the following statement is correct given that q is an unbiased estimator of Q

(A) Q is the mean of the sampling distribution of q
(B) q is the mean of the sampling distribution of Q
(C) Var(q) = Var(Q) / n where n = the sample size
(D) q = Q

12820645007. A
12820645008. B
12820645009. C
12820645010. D

Part-B Physics

Section Id :	128206328
Section Number :	2
Section type :	Online
Mandatory or Optional:	Optional
Number of Questions:	35
Number of Questions to be attempted:	35
Section Marks:	70
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	128206527
Question Shuffling Allowed :	Yes

Question Number : 16 Question Id : 12820611391 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The law of atmosphere states that at constant temperature the pressure **p** at a distance z above the surface of the earth will be related to the pressure p_0 at the surface by $p = p_0 e^{-mgz/kT}$. Here, **m** is the molecular mass and g is the acceleration due to gravity. Then the atmospheric molecules obey,

(A) Joule-Thompson effect
(B) Van der Waals law
(C) Ideal gas law
(D) Newton's cooling law

Options :
12820645011. A
12820645012. B
12820645013. C
12820645014. D

Question Number : 17 Question Id : 12820611392 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

ne experiment, at a particular instant it is found that in one mole of a gas 4782 molecules have speeds between 495 m/s and 505 m/s. The speed distribution function at the speed 500 m/s is given by,

(A) 4.2 molecules-s/m

(B) 47.2 molecules-s/m

(C) 478.2 molecules-s/m

(D) 4782.3 molecules-s/m

Options :

12820645015. A

12820645016. B

12820645017. C

12820645018. D

Question Number : 18 Question Id : 12820611393 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

In Maxwell-Boltzmann distribution, if the number of classical states in energy interval between E and E+ΔE is given by, $dS_E=g(E)dE$, then the density of states, g(E), is proportional to,

(A) $E^{1/2}$

(B) $E^{1/3}$

(C) E

(D) E^2

Options :

12820645019. A

12820645020. B

12820645021. C

12820645022. D

Question Number : 19 Question Id : 12820611394 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

In how many ways can N distinguishable particles be put into r "cells" so that n_1 particles be in the first cell, n_2 in the second cell,…,n_r in the rth cell ($\sum_i n_i = N$)?

(A) $\frac{N!}{n_1!n_2!...n_r!}$

(B) $\frac{n_1!n_2!...n_r!}{N!}$

(C) $\frac{N!}{n_1n_2...n_r}$

(D) $\frac{N!}{(n_1+n_2+\cdots+n_r)!}$

Options :

12820645023. A

12820645024. B

12820645025. C
12820645026. D

Question Number : 20 Question Id : 12820611395 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The root mean square speed of an ideal-gas molecule is greater than its average speed approximately by,

(A) 7%

(B) 8%

(C) 9%

(D) 10%

Options :

12820645027. A

12820645028. B

12820645029. C

12820645030. D

Question Number : 21 Question Id : 12820611396 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Consider a system whose state is given in terms of a complete and orthonormal set of five vectors $|\phi_1>$, $|\phi_2>$, $|\phi_3>$, $|\phi_4>$, $|\phi_5>$ as given below,

$$|\psi> = \frac{1}{\sqrt{19}}|\phi_1> + \frac{2}{\sqrt{19}}|\phi_2> + \frac{\sqrt{2}}{\sqrt{19}}|\phi_3> + \frac{\sqrt{3}}{\sqrt{19}}|\phi_4> + \frac{\sqrt{5}}{\sqrt{19}}|\phi_5>$$

Where, $|\phi_n>$ are eigen states to the system's Hamiltonian, $H|\phi_n> = n\varepsilon_0|\phi_n>$, with n=1,2,3,4,5 and ε_0 has the dimension of energy. The expectation value of the Hamiltonian H is given by,

(A) ε_0

(B) $\frac{1}{\varepsilon_0}$

(C) $\frac{52}{15}\varepsilon_0$

(D) $\frac{19}{15}\varepsilon_0$

Options :

12820645031. A

12820645032. B

12820645033. C

12820645034. D

Question Number : 22 Question Id : 12820611397 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

ball is dropped from rest at height h. Assume that the drag force from the air takes the form of $F_d = -m\alpha v$, where α is a constant, m is the mass and v is the velocity of the ball. The velocity of the ball after time 't' is,

(A) $v(t) = \frac{g}{a}(e^{-at} - 1)$

(B) $v(t) = \frac{g}{a}$

(C) $v(t) = (e^{-at} - 1)$

(D) $v(t) = ag$

Options :

12820645035. A

12820645036. B

12820645037. C

12820645038. D

Question Number : 23 Question Id : 12820611398 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Given a force $\mathbf{F}(\mathbf{r})$, a necessary and sufficient condition for the potential $V(r) = -\int_{r_0}^{r} F(r')dr'$ to be well defined that is to be path dependent is,

(A) $\nabla \times F = 0$

(B) $\nabla \times F = \infty$

(C) $\nabla . F = 0$

(D) $\nabla F = 0$

Options :

12820645039. A

12820645040. B

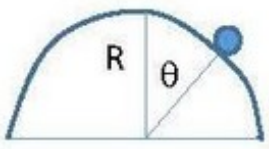
12820645041. C

12820645042. D

Question Number : 24 Question Id : 12820611399 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Consider a particle of mass m sliding off a fixed frictionless hemisphere of radius R as given in Figure. The Lagrangian L of the system is given by,



(A) $L = \frac{1}{2}mR\dot{\theta}^2 - mgRcos(\theta)$

(B) $L = \frac{1}{2}mR^2\dot{\theta}^2 - mgRcos(\theta)$

(C) $L = \frac{1}{2}mR^2\dot{\theta}^2 - mg$

(D) $L = \frac{1}{2}mR^2 - mgRcos(\theta)$

Options :

12820645043. A

12820645044. B

12820645045. C

12820645046. D

Question Number : 25 Question Id : 12820611400 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

If a particle is subject to a central force only, then which of the following is conserved,

(A) Angular momentum

(B) Linear momentum

(C) Torque

(D) Force

Options :

12820645047. A

12820645048. B

12820645049. C

12820645050. D

Question Number : 26 Question Id : 12820611401 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

A particle moves in a potential, $V(r) = -V_0 e^{-\lambda^2 r^2}$. For given Lagrangian L, the condition for the radius of the stable circular orbit is,

(A) $L^2 = 2mV_0\lambda^2 r^4 e^{-\lambda^2 r^2}$

(B) $L^2 = r^4 e^{-\lambda^2 r^2}$

(C) $L^2 = mV_0 e^{-\lambda^2 r^2}$

(D) $L^2 = mV_0\lambda^2 r^4$

Options :

12820645051. A

12820645052. B

12820645053. C

12820645054. D

Question Number : 27 Question Id : 12820611402 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

For a given Lagrangian L, the potential $V(r)$ that leads to a spiral path of the form $r = r_0 e^{a\theta}$ with the choice of E to be zero is,

(A) $V(r) = -\frac{1}{mr^2}$

(B) $V(r) = -\frac{(1+a^2)}{2mr^2}$

(C) $V(r) = -\frac{(1+a^2)L^2}{2mr^2}$

(D) $V(r) = -\frac{L^2}{2mr^2}$

12820645056. B

12820645057. C

12820645058. D

Question Number : 28 Question Id : 12820611403 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The electric field at a distance z above the center of a circular loop of radius r which carries a uniform line charge λ is,

(A) $E = \frac{1}{2\epsilon_0}\frac{1}{(r^2+z^2)^{3/2}}\hat{z}$

(B) $E = \frac{1}{2\epsilon_0}\hat{z}$

(C) $E = \frac{1}{2\epsilon_0}\lambda r z\,\hat{z}$

(D) $E = \frac{1}{2\epsilon_0}\frac{\lambda r z}{(r^2+z^2)^{3/2}}\hat{z}$

Options :

12820645059. A

12820645060. B

12820645061. C

12820645062. D

Question Number : 29 Question Id : 12820611404 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The energy stored in a uniformly charged solid sphere of radius R and charge q is given by,

(A) $W = \frac{3}{20\pi\epsilon_0}\frac{q^2}{R}$

(B) $W = \frac{3}{20\pi\epsilon_0}$

(C) $W = \frac{3}{20\pi\epsilon_0}\frac{q}{R}$

(D) $W = \frac{3}{20\pi\epsilon_0}\frac{q^2}{R^2}$

Options :

12820645063. A

12820645064. B

12820645065. C

12820645066. D

Question Number : 30 Question Id : 12820611405 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

acity per unit length of two coaxial metal cylindrical tubes of radii **a** and **b** is given by,

(A) $\frac{C}{L} = \frac{2\pi\epsilon_0}{ln\left(\frac{a}{b}\right)}$

(B) $\frac{C}{L} = \frac{2\pi\epsilon_0 a}{b}$

(C) $\frac{C}{L} = \frac{2\pi\epsilon_0}{ln\left(\frac{b}{a}\right)}$

(D) $\frac{C}{L} = \frac{2\pi\epsilon_0}{ln(ab)}$

Options :

12820645067. A

12820645068. B

12820645069. C

12820645070. D

Question Number : 31 Question Id : 12820611406 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The energy of an ideal dipole **p** in an electric field **E** is given by,

(A) $U = p^2E^2$

(B) $U = -p^2E^2$

(C) $U = -p.E$

(D) $U = \frac{E^2}{p}$

Options :

12820645071. A

12820645072. B

12820645073. C

12820645074. D

Question Number : 32 Question Id : 12820611407 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

A sphere of radius R carries a polarization P(r)=kr, where, k is a constant and **r** is the vector from the centre. The surface and volume bound charges σ and ρ are given by,

(A) σ=kR; ρ=-3k

(B) σ=kR; ρ=0

(C) σ=0; ρ=-3k

(D) σ=k; ρ=-k

Options :

12820645075. A

12820645076. B

12820645077. C

12820645078. D

Correct Marks : 2 Wrong Marks : 0

In an experiment, potassium is illuminated with ultraviolet light of wavelength $2500\dot{A}$. If the work function of potassium is 2.21 eV, the maximum kinetic energy of the emitted electrons is,

(A) 2.75eV

(B) 0.275eV

(C) 0.0275eV

(D) 0.00275eV

Options :

12820645079. A

12820645080. B

12820645081. C

12820645082. D

Question Number : 34 Question Id : 12820611409 Question Type : MCQ Option Shuffling : No Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The de Broglie wavelength of a nonrelativistic neutron with thermal energy 0.05eV is,

(A) $0.0128\dot{A}$

(B) $0.128\dot{A}$

(C) $1.28\dot{A}$

(D) $12.8\dot{A}$

Options :

12820645083. A

12820645084. B

12820645085. C

12820645086. D

Question Number : 35 Question Id : 12820611410 Question Type : MCQ Option Shuffling : No Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

An ideal gas undergoes a reversible transformation along the path $P=aV^x$, where a and x are constants with a>0. The heat capacity C along the path when x=0 is given by,

(A) $C = C_P - \frac{2}{3}Nk$

(B) $C = C_P$

(C) $C = Nk$

(D) $C = C_P + Nk$

Options :

12820645087. A

12820645088. B

12820645089. C

12820645090. D

The equation of state of radiation is PV=U/3. Stefan's law gives $U/V=\sigma T^4$, with $\sigma = \pi^2 k^4/(15\hbar^3 c^3)$. The entropy of the radiation is given by,

(A) $S = \frac{4}{3}\sigma V T^3$

(B) $S = VT$

(C) $S = \sigma V$

(D) $S = 0$

Options :

12820645091. A

12820645092. B

12820645093. C

12820645094. D

Consider a plane hkl in a crystal lattice. The angle between reciprocal lattice vector $G = hb_1 + kb_2 + lb_3$ and this plane is

(A) 90°

(B) 60°

(C) 30°

(D) 0°

Options :

12820645095. A

12820645096. B

12820645097. C

12820645098. D

The first Brillouin zone is,

(A) Wigner-Seitz primitive cell of the reciprocal lattice

(B) Triclinic primitive cell

(C) Monoclinic primitive cell

(D) Tetragonal primitive cell

Options :

12820645099. A

12820645100. B

12820645101. C

12820645102. D

. Ionic crystals are bound by,

(A) Overlap of charge distributions of antiparallel electron spin

(B) Kinetic energy of the valence electrons

(C) van der Waals interaction

(D) Electrostatic interaction of charged ions of opposite sign

Options :

12820645103. A

12820645104. B

12820645105. C

12820645106. D

Question Number : 40 Question Id : 12820611415 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The number of orbitals in a band of a specimen which have N primitive cells is,

(A) N

(B) 2N

(C) N^2

(D) $2N^2$

Options :

12820645107. A

12820645108. B

12820645109. C

12820645110. D

Question Number : 41 Question Id : 12820611416 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

wave function of a harmonic oscillator at time $t = 0$ is

$$\psi(x, 0) = \sqrt{2}A\phi_1 + \frac{1}{\sqrt{2}}A\phi_2 + A\phi_3$$

where ϕ_n is the stationary eigenfunction of the oscillator for the nth state and A is a normalization constant. The value of the constant A is:

(A) $\sqrt{\frac{2}{7}}$

(B) $\frac{2}{\sqrt{7}}$

(C) $\frac{2}{7}$

(D) $\frac{\sqrt{2}}{7}$

Options :

12820645111. A

12820645112. B

12820645113. C

12820645114. D

Question Number : 42 Question Id : 12820611417 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

. A cube of edge s and mass M is suspended vertically from one of its edges. What is the length of an equivalent simple pendulum?

(A) $\frac{2\sqrt{2}}{3}s$

(B) $\frac{2}{3}s$

(C) $\sqrt{\frac{2}{3}s}$

(D) $\frac{\sqrt{2s}}{3}$

Options :

12820645115. A

12820645116. B

12820645117. C

Question Number : 43 Question Id : 12820611418 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Consider the following operators

$$\hat{O}_1\psi(x) = x^3\psi(x) \qquad \hat{O}_2\psi(x) = x\frac{\partial\psi(x)}{\partial x}$$

The commutation relation $[\hat{O}_1, \hat{O}_2]$ is

(A) $-3x^3\psi(x)$

(B) $3x^3\psi(x)$

(C) $-3x^4\psi(x)$

(D) $3x^4\psi(x)$

Options :

12820645119. A

12820645120. B

12820645121. C

12820645122. D

Question Number : 44 Question Id : 12820611419 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Consider the wave function:

$$\psi(x,t) = [Ae^{\frac{ipx}{\hbar}} + Be^{\frac{-ipx}{\hbar}}]e^{\frac{-ip^2t}{2m\hbar}}$$

The probability current corresponding to this wave function is

(A) $\frac{p}{m}(|A|^2 - |B|^2)$

(B) $\frac{p}{m}(|A|^2 + |B|^2)$

(C) $\frac{p^2}{2m}(|A|^2 + |B|^2)$

(D) $\frac{p^2}{2m}(|A|^2 - |B|^2)$

Options :

12820645123. A

12820645124. B

12820645125. C

Question Number : 45 Question Id : 12820611420 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

At time $t = 0$ a parachutist having weight of magnitude mg is located at $z = 0$ and is travelling vertically downward with speed v_o. If the air resistance acting on the parachute is proportional to the instantaneous speed, the speed at any time $t > 0$ is

(A) $\frac{mg}{\beta} + (v_0 - \frac{mg}{\beta})e^{\frac{-\beta t}{m}}$

(B) $\frac{2mg}{\beta} + (v_0 - \frac{mg}{\beta})e^{\frac{-\beta t^2}{m}}$

(C) $(v_0 - \frac{mg}{\beta})e^{\frac{-\beta t}{m}}$

(D) $\frac{mg}{\beta} + (v_0 - \frac{g}{\beta m})e^{\frac{-\beta t}{m}}$

Options :

12820645127. A

12820645128. B

12820645129. C

12820645130. D

Question Number : 46 Question Id : 12820611421 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Estimate the uncertainty in the position of a 50 kg person moving at 2m-s^{-1}.

(A) 5×10^{-37}m

(B) 5×10^{-30}m

(C) 5×10^{-25}m

(D) 5×10^{-20}m

Options :

12820645131. A

12820645132. B

12820645133. C

12820645134. D

Question Number : 47 Question Id : 12820611422 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

quency of *Balmer series* transitions is given by

(A) $\nu_B = \frac{R}{h}\left(\frac{1}{1^2} - \frac{1}{n^2}\right)$ for all n>1

(B) $\nu_B = \frac{R}{h}\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ for all n>1

(C) $\nu_B = \frac{R}{h}\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ for all n>1

(D) $\nu_B = \frac{R}{h}\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$ for all n>1

Options :

12820645135. A

12820645136. B

12820645137. C

12820645138. D

Question Number : 48 Question Id : 12820611423 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Consider a mass–spring system where a 4 kg mass is attached to a massless spring of constant k= 196 N m^{-1}; the system is set to oscillate on a frictionless, horizontal table. The mass is pulled 25 cm away from the equilibrium position and then released. Treating the oscillator with quantum theory, find the total number of quanta involved in the process.

(A) 8.3×10^{33}

(B) 8.3×10^{30}

(C) 8.3×10^{27}

(D) 8.3×10^{22}

Options :

12820645139. A

12820645140. B

12820645141. C

12820645142. D

Question Number : 49 Question Id : 12820611424 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Estimate the energy of the electrons that we need to use in an electron microscope to resolve a separation of 0.27 nm.

(A) 20.6eV

(B) 5eV

(C) 1eV

(D) 0

Options :

12820645143. A

12820645144. B

12820645145. C
12820645146. D

Question Number : 50 Question Id : 12820611425 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

. In a scattering of 2 eV protons from a crystal, the fifth maximum of the intensity is observed at an angle of 30°. Estimate the crystal's planar separation.

(A) 0.1 nm
(B) 10 nm
(C) 100nm
(D) 1000nm

Options :
12820645147. A
12820645148. B
12820645149. C
12820645150. D

Part-B Chemistry

Section Id :	128206329
Section Number :	3
Section type :	Online
Mandatory or Optional:	Optional
Number of Questions:	35
Number of Questions to be attempted:	35
Section Marks:	70
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	128206528
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 12820611426 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

For the hydrogen atom, which of the following orbitals has the lowest energy

(A) 4s
(B) 4p
(C) 4d
(D) They all have the same energy

Options :

12820645151. A
12820645152. B
12820645153. C
12820645154. D

Question Number : 52 Question Id : 12820611427 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Two functions ψ_i and ψ_j orthogonal if $\int \psi_i^* \psi_j \, d\tau$

(A) Zero

(B) One

(C) Infinite

(D) none of the above

Options :
12820645155. A
12820645156. B
12820645157. C
12820645158. D

Question Number : 53 Question Id : 12820611428 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Under the condition P -> 0, fugacity, f is

(A) f=p

(B) f=1/p

(C) $f=P^2$

(D) $f=1/P^2$

Options :
12820645159. A
12820645160. B
12820645161. C
12820645162. D

Question Number : 54 Question Id : 12820611429 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

In Quantum Mechanics, two properties represented by operators A and B can be measured simultaneously and accurately only if

(A) A and B are not position and momentum.

(B) A is not position

(C) B is not momentum

(D) A and B commute.

Options :

12820645163. A

12820645164. B

12820645165. C

12820645166. D

Question Number : 55 Question Id : 12820611430 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

What is the electron configuration for an atom with Z = 22?

(A) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^4$

(B) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4p^2$

(C) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^2 4p^2$

(D) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$

Options :

12820645167. A

12820645168. B

12820645169. C

12820645170. D

Question Number : 56 Question Id : 12820611431 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The preference of three unpaired electrons in nitrogen atom can be explained by:

(A) Pauli's exclusion principle

(B) Aufbau principle

(C) Uncertainty principle

(D) Hund's rule

12820645171. A
12820645172. B
12820645173. C
12820645174. D

Question Number : 57 Question Id : 12820611432 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Partition function of a system in canonical ensemble (where beta has the usual meaning) where energies are equispaced with a gap of eps is

(A) 1/(1-exp(-beta.eps))

(B) 1-exp(-beta.eps)

(C) exp(-beta.eps)

(D) 1/1+exp(-beta.eps)

Options :
12820645175. A
12820645176. B
12820645177. C
12820645178. D

Question Number : 58 Question Id : 12820611433 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Average kinetic energy coming from internal vibration of Methane at temperature T is (k=Boltzmann constant)

(A) 15/2 kT
(B) 9/2 kT
(C) 9 kT
(D) 15 kT

Options :
12820645179. A
12820645180. B
12820645181. C
12820645182. D

Question Number : 59 Question Id : 12820611434 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Which of the following compounds has a bond formed by overlap of SP-SP3 hybrid orbitals?

(A) CH_3-C_2H
(B) C_2H_2
(C) $CH_2CHCHCH_2$
(D) $CH_3CHCHCH_3$

Options :
12820645183. A
12820645184. B
12820645185. C
12820645186. D

Question Number : 60 Question Id : 12820611435 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

An ideal gas is allowed to expand adiabatically against vacuum (opposing pressure is zero). Which of the following statements is FALSE?

(A) The equation $PV^{\gamma} = constant$ holds for this process.
(B) The expansion is isothermal
(C) No work is done in this expansion
(D) The process is irreversible

Options :
12820645187. A
12820645188. B
12820645189. C
12820645190. D

Question Number : 61 Question Id : 12820611436 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Which of the following hydrogen bonds is the strongest?

(A) O – H ---F
(B) O – H ---H
(C) F – H ---F
(D) O – H ---O

Options :
12820645191. A
12820645192. B
12820645193. C
12820645194. D

For an ideal gas, number of moles per litre in terms of its pressure P, gas constant R and temperature T is

(A) PT/R

(B) PRT

(C) P/RT

(D) RT/P

Options :
12820645195. A
12820645196. B
12820645197. C
12820645198. D

The IUPAC name of $CH_3COCH(CH_3)_2$ is

(A) 2-methyl-3-butanone

(B) 4-methylisopropyl ketone

(C) 3-methyl-2-butanone

(D) Isopropylmethyl ketone

Options :
12820645199. A
12820645200. B
12820645201. C
12820645202. D

Hydrogen ion concentration in mol/L in a solution of pH = 5.4 will be

(A) 3.98×10^{-6}

(B) 3.68×10^{-6}

(C) 3.88×10^{6}

(D) 3.98×10^{8}

Options :
12820645203. A

12820645204. B
12820645205. C
12820645206. D

Question Number : 65 Question Id : 12820611440 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

If an endothermic reaction is non-spontaneous at freezing point of water and becomes feasible at its boiling point, then

(A) ΔH is –ve, ΔS is +ve

(B) ΔH and ΔS both are +ve

(C) ΔH and ΔS both are –ve

(D) ΔH is +ve, ΔS is –ve

Options :
12820645207. A
12820645208. B
12820645209. C
12820645210. D

Question Number : 66 Question Id : 12820611441 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

For the reaction $A+zB \rightarrow C$, the rate is given by $R= [A] [B]^2$ then the order of the reaction is

(A) 3

(B) 6

(C) 5

(D) 7

Options :
12820645211. A
12820645212. B
12820645213. C
12820645214. D

Question Number : 67 Question Id : 12820611442 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

alf-life of a substance is 5 years, then the total amount of substance left after 15 years, when initial amount is 64 grams is

(A) 16 grams

(B) 2 grams

(C) 32 grams

(D) 8 grams

Options :

12820645215. A

12820645216. B

12820645217. C

12820645218. D

Question Number : 68 Question Id : 12820611443 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

In Diamond, the coordination number of carbon is

(A) four and its unit cell has eight carbon atoms

(B) four and its unit cell has six carbon atoms

(C) six and its unit cell has four carbon atoms

(D) four and its unit cell has four carbon atoms

Options :

12820645219. A

12820645220. B

12820645221. C

12820645222. D

Question Number : 69 Question Id : 12820611444 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The hybridization of atomic orbitals of nitrogen in NO_2^+. NO_3^-, NH_4^+

(A) sp2. sp3 and sp2 respectively

(B) sp. sp2 and sp3 respectively

(C) sp2. sp and sp3 respectively

(D) sp2. sp3 and sp respectively

Options :

12820645223. A

12820645224. B

12820645225. C
12820645226. D

Question Number : 70 Question Id : 12820611445 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The half-life of a first order reaction varies with temperature(T) according to

(A) $\ln t_{1/2}$ proportional 1/T

(B) $\ln t_{1/2}$ proportional T

(C) $t_{1/2}$ proportional $1/T^2$

(D) $t_{1/2}$ proportional T^2

Options :
12820645227. A
12820645228. B
12820645229. C
12820645230. D

Question Number : 71 Question Id : 12820611446 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The IUPAC name of C_6H_5COCl is

(A) Benzene Chloro ketone

(B) Benzoyl Chloride

(C) Chloro Phenyl ketone

(D) Benzene carbonyl chloride

Options :
12820645231. A
12820645232. B
12820645233. C
12820645234. D

Question Number : 72 Question Id : 12820611447 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

f the compounds undergoes decarboxylation easily

(A) C_6H_5-CO-CH_2-COOH

(B) C_6H_5-CO-COOH

(C) C_6H_5-CH(OH)-COOH

(D) C_6H_5-CH(NH_2)=COOH

Options :

12820645235. A

12820645236. B

12820645237. C

12820645238. D

Question Number : 73 Question Id : 12820611448 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

According to kinetic theory of gases, the root mean square velocity is

(A) proportional to the temperature

(B) proportional to the square of temperature

(C) proportional to squre root of the temperature

(D) inversely proportional to the square root of the temperature

Options :

12820645239. A

12820645240. B

12820645241. C

12820645242. D

Question Number : 74 Question Id : 12820611449 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Wave function in quantum mechanics represents

(A) a state of the system

(B) shape of the system

(C) probability of the system

(D) energy of the system

Options :

12820645243. A

12820645244. B

12820645245. C
12820645246. D

Question Number : 75 Question Id : 12820611450 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The Infrared and Raman spectrum for BF_3 are expected to show

(A) the same number of peaks
(B) more absorption peaks in IR in comparison to Raman
(C) more absorption peaks in Raman in comparison with IR
(D) absorption peaks present in Raman are absent in IR

Options :
12820645247. A
12820645248. B
12820645249. C
12820645250. D

Question Number : 76 Question Id : 12820611451 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

In a canonical ensemble, a system A of fixed volume is in contact with a large reservoir B. Then .....

(A) A can exchange only energy with B
(B) A can exchange only particles with B
(C) A can exchange neither energy nor particles with B
(D) A can exchange both energy and particles with B

Options :
12820645251. A
12820645252. B
12820645253. C
12820645254. D

Question Number : 77 Question Id : 12820611452 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

. Consider the Arrhenius equation given below and mark the correct option. $k = A\, e^{-Ea/RT}$

(A) Rate constant increases exponentially with increasing activation energy and decreasing temperature.
(B) Rate constant decreases exponentially with increasing activation energy and decreasing temperature.
(C) Rate constant increases exponentially with decreasing activation energy and decreasing temperature.
(D) Rate constant increases exponentially with decreasing activation energy and increasing temperature.

Options :

12820645255. A
12820645256. B
12820645257. C
12820645258. D

Question Number : 78 Question Id : 12820611453 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The value of rate constant of a pseudo first order reaction _____.

(A) depends on the concentration of reactants present in small amount.
(B) depends on the concentration of reactants present in excess.
(C) is independent of the concentration of reactants.
(D) depends only on temperature.

Options :
12820645259. A
12820645260. B
12820645261. C
12820645262. D

Question Number : 79 Question Id : 12820611454 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The oxidation number of P in $H_4P_2O_7$ is

(A) -10
(B) -5
(C) +5
(D) +10

Options :
12820645263. A
12820645264. B
12820645265. C
12820645266. D

Question Number : 80 Question Id : 12820611455 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Work done in free expansion process

(A) maximum
(B) negative
(C) zero
(D) positive

Options :
12820645267. A
12820645268. B
12820645269. C
12820645270. D

The activation energy of a reaction at a given temperature is found to be 2.303 RT J mol^{-1}. The ratio of rate constant to the Arrhenius factor is

(A) 0.1
(B) 0.01
(C) 0.001
(D) 0.02

Options :
12820645271. A
12820645272. B
12820645273. C
12820645274. D

Radioactivity of a sample (z = 22) decreases 90% after 10 years. What will be the half-life of the sample?

(A) 5 years
(B) 6 years
(C) 3 years
(D) 10 years

Options :
12820645275. A
12820645276. B
12820645277. C
12820645278. D

In a protein molecule, various amino acids are linked together by

(A) Peptide bond
(B) Dative bond
(C) α-glycosidic bond
(D) β-glycosidic bond

Options :
12820645279. A
12820645280. B
12820645281. C
12820645282. D

Marks : 2 Wrong Marks : 0

Which one of the following statements is correct?

(A) All amino acids except lysine are optically active
(B) All amino acids are optically active
(C) All amino acids except glycine are optically active
(D) All amino acids except glutamic acids are optically active

Options :

12820645283. A

12820645284. B

12820645285. C

12820645286. D

Question Number : 85 Question Id : 12820611460 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

What should be the correct IUPAC name for diethylbromomethane?

(A) 1-Bromo-1,1-diethylmethane
(B) 3-Bromopentane
(C) 1-Bromo-1-ethylpropane
(D) 1-Bromopentane

Options :

12820645287. A

12820645288. B

12820645289. C

12820645290. D

Part-B Mathematics

Section Id :	128206330
Section Number :	4
Section type :	Online
Mandatory or Optional:	Optional
Number of Questions:	35
Number of Questions to be attempted:	35
Section Marks:	70
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	128206529
Question Shuffling Allowed :	Yes

Question Number : 86 Question Id : 12820611461 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

aph G = (V,E), the number of vertices of odd degree is always

(A) odd

(B) even

(C) prime

(D) irrational

Options :

12820645291. A

12820645292. B

12820645293. C

12820645294. D

Question Number : 87 Question Id : 12820611462 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

From the definition of isomorphism, two isomorphic graphs have

(A) same number of edges

(B) same number of vertices

(C) same number of vertices with same degree

(D) all a,b,c,d

Options :

12820645295. A

12820645296. B

12820645297. C

12820645298. D

Question Number : 88 Question Id : 12820611463 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Maximum degree of any vertex in a simple graph with n vertices is

(A) n

(B) n-1

(C) n-2

(D) n/2

Options :

12820645299. A

12820645300. B

12820645301. C

12820645302. D

Question Number : 89 Question Id : 12820611464 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

he size and order of complement of K_n graph.

(A) n/2, n

(B) n, n

(C) ${}^nC_2$, Zero

(D) n, zero

Options :

12820645303. A

12820645304. B

12820645305. C

12820645306. D

Question Number : 90 Question Id : 12820611465 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Let G is a graph with 12 edges. If G has 6 vertices each of degree 3 and the rest have degree less than 3, what is the minimum number of vertices G can have

(A) 8

(B) 12

(C) 9

(D) 36

Options :

12820645307. A

12820645308. B

12820645309. C

12820645310. D

Question Number : 91 Question Id : 12820611466 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The connected graph G is decomposed into two subgraphs H_1 and H_2 then there is .....common between H_1 and H_2.

(A) at least one vertex

(B) at most one vertex

(C) minimum one vertex

(D) maximum one vertex

Options :

12820645311. A

12820645312. B

12820645313. C

12820645314. D

Question Number : 92 Question Id : 12820611467 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

gree of each vertex in a graph is at least two, then G contains a

(A) Cycle

(B) path

(C) Multiple edges

(D) Circuit

Options :

12820645315. A

12820645316. B

12820645317. C

12820645318. D

Question Number : 93 Question Id : 12820611468 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

A connected graph is .....if and only if it can be partitioned into.....

(A) Hamiltonium, path

(B) Eulerian, circuit

(C) Eulerian, path

(D) Regular, trail

Options :

12820645319. A

12820645320. B

12820645321. C

12820645322. D

Question Number : 94 Question Id : 12820611469 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

A simple graph G with n greater than equal to 3 vertices and degree of every vertex at least

(A) n/2 has a Hamilton circuit

(B) n/2 has a Euler circuit

(C) n has a Hamilton circuit

(D) n has a Euler circuit

Options :

12820645323. A

12820645324. B

12820645325. C

12820645326. D

Question Number : 95 Question Id : 12820611470 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

(A) Eulerian

(B) Hamiltonion

(C) tree

(D) forest

Options :

12820645327. A

12820645328. B

12820645329. C

12820645330. D

Question Number : 96 Question Id : 12820611471 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The distance between vertices in a connected graph G is a .....

(A) matrix

(B) metric

(C) determinant

(D) none

Options :

12820645331. A

12820645332. B

12820645333. C

12820645334. D

Question Number : 97 Question Id : 12820611472 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The number of pendant vertices in a binary tree T with ..... vertices is.....

(A) n, (n+1)/2

(B) n/2, n/2

(C) n-1, (n-1)/2

(D) n, n-1

Options :

12820645335. A

12820645336. B

12820645337. C

12820645338. D

Question Number : 98 Question Id : 12820611473 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

ny non-isomorphic trees with six vertices are possible?

(A) 6

(B) 12

(C) 5

(D) 4

Options :

12820645339. A

12820645340. B

12820645341. C

12820645342. D

Question Number : 99 Question Id : 12820611474 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

An edge e of G is a ..... of G if and only if e is contained in .....of G.

(A) bridge, no circuit

(B) path, circuit

(C) cut, path

(D) none

Options :

12820645343. A

12820645344. B

12820645345. C

12820645346. D

Question Number : 100 Question Id : 12820611475 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

A planar connected graph with less than 30 edges has a vertex of degree.....

(A) less than equal to 4

(B) greater than equal to 4

(C) strictly equal to 4

(D) strictly greater than 4

Options :

12820645347. A

12820645348. B

12820645349. C

12820645350. D

Question Number : 101 Question Id : 12820611476 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

feasible flow and (X,Y) is any cut then

(A) val f less than equal to cap K

(B) val f greater than equal to cap K

(C) val f equal to cap K

(D) none

Options :

12820645351. A

12820645352. B

12820645353. C

12820645354. D

Question Number : 102 Question Id : 12820611477 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Let A(G) be an incidence matrix of a connected graph G with n vertices, than

(A) rank of A(G) is n

(B) rank of A(G) is n-1

(C) rank of A(G) is n+1

(D) rank of A(G) is n/2

Options :

12820645355. A

12820645356. B

12820645357. C

12820645358. D

Question Number : 103 Question Id : 12820611478 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Let G be a simple graph and P(G) is its path matrix then which of the following statement is true for path matrix

(A) A column with all 0's corresponding to an edge that does not lies in any path between v_i and v_j.

(B) A row with all 0's corresponding to an edge that does not lies in any path between v_i and v_j.

(C) A column with all 1's corresponding to an edge that does not lies in any path between v_i and v_j.

(D) A row with all 1's corresponding to an edge that does not lies in any path between v_i and v_j.

Options :

12820645359. A

12820645360. B

12820645361. C

12820645362. D

Question Number : 104 Question Id : 12820611479 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

e with two or more vertices is

(A) 2-chromatic

(B) 3-chromatic

(C) 1-chromatic

(D) Chromatic number is not defined

Options :

12820645363. A

12820645364. B

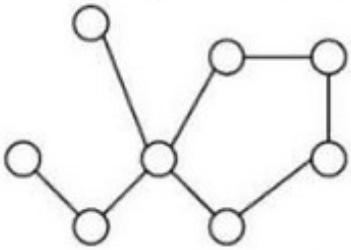
12820645365. C

12820645366. D

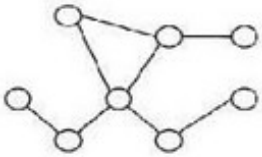
Question Number : 105 Question Id : 12820611480 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

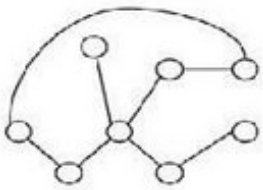
Which of the following graphs is isomorphic to below graph?



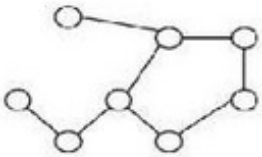
(A)



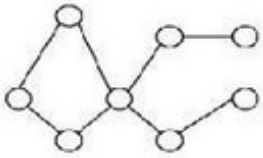
(B)



(C)



(D)



(A) A

(B) B

(C) C

(D) D

Options :

12820645367. A

12820645368. B

12820645369. C

12820645370. D

Question Number : 106 Question Id : 12820611481 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

$R^3 \to R^3$ such that $I(a,b,c) = (0,a,b)$, for $(a,b,c) \in R^3$. Then $T + I$ is a zero of the polynomial:

(A) t

(B) t^2

(C) t^3

(D) none of above

Options :

12820645371. A

12820645372. B

12820645373. C

12820645374. D

Question Number : 107 Question Id : 12820611482 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

When a cylindrical vessel, containing some liquid, is rotated about its vertical axis, the liquid surface is depressed down at the axis of its rotation and rises up near the walls of the vessel on all sides. This type of flow is known as

(A) steady flow

(B) turbulent flow

(C) vortex flow

(D) uniform flow

Options :

12820645375. A

12820645376. B

12820645377. C

12820645378. D

Question Number : 108 Question Id : 12820611483 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The Euler's equation for the motion of liquids is based upon the assumption that

(A) the fluid is non - viscous, homogeneous and incompressible

(B) the velocity of flow is uniform over the section

(C) the flow is continuous, steady and along the stream line

(D) all of the above

Options :

12820645379. A

12820645380. B

12820645381. C

12820645382. D

The shear stress-strain graph for a Newtonian fluid is a

(A) straight line
(B) parabolic curve
(C) hyperbolic curve
(D) elliptical

Options :

12820645383. A

12820645384. B

12820645385. C

12820645386. D

A flow in which the viscosity of fluid is dominating over the inertia force is called

(A) steady flow
(B) unsteady flow
(C) laminar flow
(D) turbulent flow

Options :

12820645387. A

12820645388. B

12820645389. C

12820645390. D

A flow through a long pipe at constant rate is called

(A) steady uniform flow
(B) steady non-uniform flow
(C) unsteady uniform flow
(D) unsteady non-uniform flow

Options :

12820645391. A

12820645392. B

12820645393. C

12820645394. D

lines and path lines always coincide in case of
(A) steady flow
(B) laminar flow
(C) uniform flow
(D) turbulent flow

Options :
12820645395. A
12820645396. B
12820645397. C
12820645398. D

Question Number : 113 Question Id : 12820611488 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The eddy viscosity for turbulent flow is

(A) a function of temperature only

(B) a physical property of the fluid.

(C) dependent on the flow

(D) independent of the flow

Options :
12820645399. A
12820645400. B
12820645401. C
12820645402. D

Question Number : 114 Question Id : 12820611489 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Stress strain relationship for Newtonian fluid is
(A) Parabolic

(B) Hyperbolic

(C) Linear

(D) Inverse type

Options :
12820645403. A
12820645404. B
12820645405. C
12820645406. D

Question Number : 115 Question Id : 12820611490 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

tinuity equation is the result of application of the following law to the flow field
(A) First law of thermodynamics

(B) Conservation of energy

(C) Newton's second law of motion

(D) Conservation of mass

Options :
12820645407. A
12820645408. B
12820645409. C
12820645410. D

Question Number : 116 Question Id : 12820611491 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Relative density of mercury is
(A) 1

(B) 9.8

(C) 13.6

(D) 1000

Options :
12820645411. A
12820645412. B
12820645413. C
12820645414. D

Question Number : 117 Question Id : 12820611492 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

Suppose you made 40 confidence intervals with confidence level 95%. About how many of them would you expect to be "wrong'? That is, how many would not actually contain the parameter being estimated?

(A) 4
(B) 2
(C) 8
(D) 10

Options :
12820645415. A
12820645416. B
12820645417. C
12820645418. D

Question Number : 118 Question Id : 12820611493 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

neulli's equation is based on the assumption that

(A) there is no loss of energy of the liquid flowing
(B) the velocity of flow is uniform across any cross-section of the pipe
(C) no force except gravity acts on the fluid
(D) all of the above

Options :
12820645419. A
12820645420. B
12820645421. C
12820645422. D

Question Number : 119 Question Id : 12820611494 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The flow of water through the hole in the bottom of a wash basin is an example of

(A) steady flow
(B) uniform flow
(C) free vortex
(D) forced vortex

Options :
12820645423. A
12820645424. B
12820645425. C
12820645426. D

Question Number : 120 Question Id : 12820611495 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 2 Wrong Marks : 0

The velocity at which the laminar flow stops, is known as

(A) velocity of approach
(B) lower critical velocity
(C) higher critical velocity
(D) none of these

Options :
12820645427. A
12820645428. B
12820645429. C
12820645430. D