SRMJEEE 2019 Question Paper with Answer Key

SRM Joint Engineering Entrance Examination - SRMJEEE

Q1 : Which of the following is both unitless and dimensionless?

A angle

B solid angle

C mechanical equivalent of heat

D refractive index

Correct Ans : **D**

Q2 : How many astronomical units are there in 1 metre

A 6.68×10^{12} Au

B 6.68×10^{-10} Au

C 6.68×10^{10} Au

D 6.68×10^{-12} Au

Correct Ans : **D**

Q3 : A lift is moving up with an acceleration equal to 1/5 of that due to gravity. The apparent weight of a 60 kg man standing in lift is:

A 60 kg wt

B 72 kg wt

C 48 kg wt

D zero

Correct Ans : **B**

Q4 : The friction of air causes a vertical resistance of 10% in acceleration due to gravity. The maximum height will be decreased by

A 11%

B 10%

C 9%

D 8%

Correct Ans : **C**

Q5 : A projectile can have the same range R for two angles of projection. If t_1 and t_2 can be the times of flight in the two cases then what is the product of the two times of flight?

A $t_1 t_2 \propto R^2$

B $t_1 t_2 \propto R$

C $t_1 t_2 \propto 1/R$

D $t_1 t_2 \propto 1/R^2$

Correct Ans : **B**

Q6 : A body is moving with a constant speed 'V' in a circle of radius r. Its angular acceleration is _____

A vr

B zero

C v/r

D v/r^2

Correct Ans : **B**

Q7 : If total energy of an earth's satellite is zero, it means that

A The satellite is bound to earth

B The satellite may no longer be bound to earth's field

C The satellite moves away from the orbit along a parabolic path

D The satellite escapes in a hyperbolic path

Correct Ans : **C**

Q8 : A spring balance is graduated on sea level. If a body is weighed with this balance at consecutively increasing heights from earth's surface, the weight indicated by the balance

A will go on increasing continuously

B will go on decreasing continuously

C will remain same

D will first increase and then decrease

Correct Ans : **B**

Q9 : A steel ring of radius r and cross sectional area 'A' is fitted on to a wooden disc of radius R (R > r). If the Young's modulus be Y, then what is the force with which steel ring is expanded?

A $\frac{AYR}{r}$

B $\frac{AR}{Y_r}$

C $\frac{A}{Y}\left(\frac{r}{R-r}\right)$

D $AY\left(\frac{R-r}{R}\right)$

Correct Ans : **D**

Q10 : A tuning fork arrangement produces 4 beats/second with one fork of frequency 288 Hz. A little wax is applied on the unknown fork and it then produces 2 beats/s. The frequency of the unknown fork is.....Hz.

A 286

B 292

C 294

D 288

Correct Ans : **B**

Q11 What is the phase difference between velocity and acceleration of a particle executing SHM?
:

A 0

B π

C π / 2

D π / 4

Correct Ans : **C**

Q12 A stone is dropped into a lake by a person from a 500m high tower. He would hear the sound
: after approximately

A 10 sec

B 11.5 sec

C 14 sec

D 21 sec

Correct Ans : **B**

Q13 If the values of R=2/5 C_v for a gas, then the atomicity of the gas will be
:

A mono atomic

B diatomic

C polyatomic

D triatomic

Correct Ans : **B**

Q14 A domestic refrigerator is loaded with food and the door closed. During a certain period the
: machine consumes 1 KWh of energy and the internal energy of the system drops by 5000KJ. Find the net heat transfer for the system.

A -8.6 MJ

B 86MJ

C -86MJ

D -8.6KJ

Correct Ans : **D**

Q15 If the rate at which the radiation is conuited by a black body at 0^{o}C is 2 watt, the rate of
: emission at 273^{o}C will be

A 4 watt

B 8 watt

C 16 watt

D 20 watt

Correct Ans : **C**

Q16 If the door of a refrigerator in a room is kept open, the temperature of room will be
:

A increase

B decrease

C remain constant

D uncertain

Correct Ans : **A**

Q17 The resolution limit of eye is 60 s. At a distance of X km from the eye two persons stand with
: lateral separation of 3 m. For the two persons to be just resolved by eye, X should be

A 10 km

B 15 km

C 20 km

D 30 km

Correct Ans : **A**

Q18 Convex lens always gives a real image if the object is situated beyond _____
:

A Optic centre

B Focus

C Radius of curvature

D Centre of curvature

Correct Ans : **B**

Q19 How many orders will be visible if the wavelength of the incident radiation is 5000 Å and the
: number of lines on the grating is 2620 in one inch?

A 20

B 19

C 18

D 15

Correct Ans : **B**

Q20 Huygen's principle of secondary waves is used to
:

A obtain the wave front geometrically

B explain polarisation

C obtain focal length of thick lenses

D explain dispersion of light

Correct Ans : **A**

Q21 What determines the charge that flows through a circuit due to the induced emf?
:

A The total change of magnetic flux

B The rate of change in magnetic flux and resistance

C The initial magnetic flux

D The final magnetic flux

Correct Ans : **B**

Q22 : A pair of coil has a mutual inductance of 2 H, if the current in the primary changes from 10 A to zero in 0.1 S, the induced emf in the secondary will be

A 100 V

B 200 V

C 300 V

D 400 V

Correct Ans : **B**

Q23 : The unit of relative permittivity is

A $C^2N^{-1}m^{-2}$

B Nm^2C^{-2}

C unitless

D $NC^{-2}m^{-2}$

Correct Ans : **C**

Q24 : The frequency of the charged particle circular at right angles to a uniform magnetic field does not depend upon the

A speed of the particle

B mass of the particle

C charge of the particle

D magnetic field

Correct Ans : **A**

Q25 : The ratio of the radii of the nuclei $_{13}Al^{27}$ and $_{52}Te^{125}$ is approximately

A 6:10

B 13:52

C 40:17

D 14:73

Correct Ans : **A**

Q26 : If ionising energy of H atom is 13.6eV, then the second ionising energy of He should be

A 13.6eV

B 27.2eV

C 54.4eV

D cannot be predicted.

Correct Ans : **C**

Q27 : Radiation of two photons having energies twice and five times the work function of a metal are incident successively on the metal surface. Find out the ratio of maximum velocity of photo electrons emitted in the two cases.

A $v_1/v_2=1/3$

B $v_1/v_2=1/4$

C $v_1/v_2=1$

D $v_1/v_2=1/2$

Correct Ans : **D**

Q28 : An electron in Bohr's hydrogen atom has an energy of -3.4 eV. The angular momentum of the electron is:

A h / π

B h / 2π

C nh / 2π(n is an integer)

D 2h / π

Correct Ans : **A**

Q29 : Weak nuclear forces act on

A both hadrons and leptons

B hadrons only

C All particles

D leptons only

Correct Ans : **C**

Q30 : When boron $_5B^{10}$ is bombarded by neutron, alpha particles are emitted. The resulting nucleus has the mass number.

A 11

B 7

C 6

D 15

Correct Ans : **B**

Q31 : A piece of an ancient wooden boat shows an activity of C^{14} of 3.9 disintegrations per minute per gm of carbon. Estimate the age of the boat, if the half life of C^{14} is 5.568 years. Assume that the activity of fresh carbon -14 is 15.6 dpm.gm

A 11.136 years

B 8.121 years

C 6.312 years

D 12.631 years

Correct Ans : **A**

Q32 Which of the following transitions in hydrogen atoms emit photons of highest frequency?
:

A n = 1 to n = 2

B n = 6 to n = 2

C n = 2 to n = 6

D n = 2 to n = 1

Correct Ans : **D**

Q33 The most widely used rectifier is
:

A Half-wave rectifier

B Centre-tap full-wave rectifier

C Bridge full-wave rectifier

D Quarter-wave rectifier

Correct Ans : **C**

Q34 Connecting a lead from the negative to the positive of a battery will produce
:

A a high resistance circuit

B a short circuit

C a low current path

D an open circuit

Correct Ans : **B**

Q35 What is the net charge if a certain semiconductor losses 4 valence electrons?
:

A +4

B -4

C +8

D -8

Correct Ans : **A**

Q36 X-rays of wave-length 1.14 A in the first order reflection from a crystal, were reflected at an
: angle of 30°.
The inter planar distance in the crystal is (Sin 30° is 0.5)

A 3.8A°

B 1.14A°

C 0.342A°

D 2.28A°

Correct Ans : **B**

Q37 : In a flask of 'V' litres, 0.2 moles of O_2, 0.4 moles of N_2, 0.1 moles of NH_3 and 0.3 moles of He gases are present at 27°C. If total pressure exerted by these non-reaching gases is 1 atm, the partial pressure exerted by N_2 gas is

A 0.4 atm

B 0.3 atm

C 0.2 atm

D 0.1 atm

Correct Ans : **A**

Q38 : The density of O_2 is 16 at NTP. At what temperature its density will be 14? consider that the pressure remain the constant at

A 50°C

B 39°C

C 57°C

D 43°C

Correct Ans : **B**

Q39 : The correct sequence which shows decreasing order of the ionic radii of the elements is

A $Al^{3}+ > Mg^{2+} > Na^{+} > F^{-} > O^{2-}$

B $Na^{+} > Mg^{2+} > Al^{3+} > O^{2-} > F^{-}$

C $Na^{+} > F^{-} > Mg^{2+} > O^{2} > Al^{3+}$

D $O^{2}- > F^{-} > Na^{+} > Mg^{2+} > Al^{3+}$

Correct Ans : **D**

Q40 : IUPAC name of element having atomic number 108 is

A Unniloctium

B Ununoctium

C Nilniloctinium

D Ununoctinium

Correct Ans : **A**

Q41 : The hybridization of NH_3 and NO_2^{-}

A sp^3 and dsp^2

B sp and sp^3

C sp^3 and sp^2

D spd^2 and sp^2

Correct Ans : **C**

Q42 The nature of positive rays depends on
:

A The nature of discharge tube

B The nature of electrode

C The nature of the gas in the discharge tube

D Pressure of the gas in the discharge tube

Correct Ans : **C**

Q43 One mole of oxygen gas at STP is equal to
:

A 16 g of oxygen

B 6.022 × 10^{23} atoms of oxygen

C 36 g of oxygen

D 12 g of oxygen

Correct Ans : **B**

Q44 Mean distance between atoms in the range of
:

A 25 nm

B 2.5 nm

C 0.25 nm

D 0.025 nm

Correct Ans : **C**

Q45 What is the mass of 0.5 mole of ozone molecule?
:

A 14 g

B 24 g

C 12 g

D 18 g

Correct Ans : **B**

Q46 The hybridization of sulphur in sulphur dioxide is:
:

A sp

B sp^3

C sp^2

D dsp^2

Correct Ans : **C**

Q47 Hydrogen bonding is maximum in
:

A Ethanol

B Diethyl ether

C Ethyl Chloride

D Triethyl amine

Correct Ans : **A**

Q48 The 3s orbital has
:

A no node

B 1 node

C 2 nodes

D 3 nodes

Correct Ans : **C**

Q49 Which parameter always increases during spontaneous change?
:

A Δ_G

B $\Delta_{S_{total}}$

C Δ_H

D $\Delta_{n(g)}$

Correct Ans : **B**

Q50 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

Correct Ans : **B**

Q51 At constant T and P, which one of the following statements is correct for the
: reaction $CO(g) + \frac{1}{2}O_2(g) \rightarrow CO_2(g)$?

A $\Delta_H = \Delta_E$

B $\Delta_H < \Delta_E$

C $\Delta_H > \Delta_E$

D ΔH is independent of the physical state of the reactants

Correct Ans : **B**

Q52 : The binary mixtures having the same composition in liquid and vapour phase and boil at a constant temperature are called

A Solid solutions

B Azeotropes

C Ideal solution

D Zwitter ions

Correct Ans : **B**

Q53 : Molarity of 4.9g of H_2SO_4 in 250 cm^3 solution is

A 0.1 M

B 0.2 M

C 0.05 M

D 0.5 M

Correct Ans : **B**

Q54 : The degree of dissociation of 0.1 M HCN solution is 0.01%. Its ionization constant would be

A 10^{-9}

B 10^{-3}

C 10^{-7}

D 10^{-11}

Correct Ans : **A**

Q55 : The pH of 0.1 M solution of the following salts increases in the order

A NaCl< NH_4 Cl < NaCN < HCl

B HCl < NH_4 Cl < NaCl < NaCN

C NaCN< NH_4Cl < NaCl < HCl

D HCl < NaCl < NaCN < NH_4Cl

Correct Ans : **B**

Q56 : On the electrolysis of aqueous solution of Na_2SO_4, on cathode we get

A Na

B H_2

C SO_2

D SO_3

Correct Ans : **B**

Q57 Wooden artifacts and freshly cut tree having 7.6 and 15.2 counts min^{-1} g^{-1} of carbon (t1/2 = 5700 years) respectively. Calculate the age of artifact.
:

A 5700 years

B 6000 years

C 6500 years

D 5900 years

Correct Ans : **A**

Q58 In the phenomenon, in which a substance formed in the course of a reaction itself act as a catalyst is called
:

A catalytic poison

B autocatalysis

C negative catalysis

D induced catalysis

Correct Ans : **B**

Q59 The green flame of organic compound in Beilstein's test indicates presence of
:

A Nitrogen

B Sulphur

C Oxygen

D Halogens

Correct Ans : **D**

Q60 0.207 gram of organic compound gave 0.282 gram of silver bromide when heated with excess of nitric acid and silver nitrate. The percentage of bromine in the organic compound is
:

A 71.57%

B 52.28%

C 57.97%

D 35.45%

Correct Ans : **C**

Q61 Carbocation intermediate is involved in reactions,
:

A SN_2 reactions

B SN_1 reactions

C E_2 Eliminiation

D Electrocyclic reaction

Correct Ans : **B**

Q62 : The mechanism involved in the preparation of glycol from 1,2-dihaloethane using aqueous Na_2CO_3 is

A SN^1 attack by OH-

B SN^2 attack by Br-

C SN^2 attack by OH-

D SN^1 attack by Br-

Correct Ans : **C**

Q63 : The product formed in the reaction $C_6H_5 - C \equiv C - CH_3 \xrightarrow[85^oC]{HgSO_4 / H_2SO_4}$

A $C_6H_5 - CH_2\ CO\ CH_3$

B $C_6H_5\ CO\ CH_2\ CH_3$

C $C_6H_5\ CO\ CO\ CH_3$

D
$$C_6H_5 - \underset{\displaystyle CH_3}{\overset{\displaystyle |}{CH}} - CH_2 - OH$$

Correct Ans : **B**

Q64 : Presence of nitro group in a benzene ring

A deactivates the ring towards electrophilic substitution

B activates the ring towards electrophilic substitution

C renders the ring basic

D deactivates the ring towards nucleophilic substitution.

Correct Ans : **A**

Q65 : Hydrolysis of diazonium salt produces

A benzene

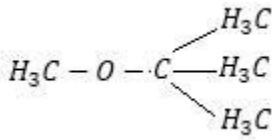
B phenol

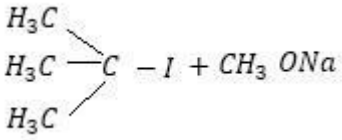
C aniline

D azobenzene

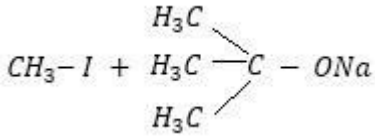
Correct Ans : **B**

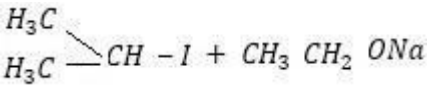
Q66 :

In the Williamsons synthesis for preparation of  the compounds used are

A 

B CH_3 - CH_2 I + C_2H_5ONa

C 

D 

Correct Ans : **C**

Q67 Which product is formed, when acetonitrile is hydrolysed partially with cold concentrated HCl **:**

A Methyl cyanide

B Acetic anhydrides

C Acetic acid

D Acetamide

Correct Ans : **D**

Q68 Which among the following cannot react with nitrous acid? **:**

A CH_3 $CONH_2$

B $(CH_3)_3$ C-NO_2

C $(CH_3$ $CH_2)_2$ NH

D CH_3 CH_2 NH_2

Correct Ans : **B**

Q69 Which of the following statements about addition polymers is correct? **:**

A They are soluble in water.

B They have the same general formula.

C They are formed from monomers with unsaturated C-C bonds.

D They are strong and rigid.

Correct Ans : **C**

Q70 Each unit of DNA has
:

A number of purine nucleotides = number of pyrimidine nucleotides

B purine nucleotides > pyrimidine nucleotides

C pyrimidine nucleotides > purine nucleotides

D varies with person to person

Correct Ans : **A**

Q71
: The values of $sin^2\frac{\Lambda}{8}+sin^2\frac{3\Lambda}{8}+sin^2\frac{5\Lambda}{8}+sin^2\frac{7\Lambda}{8}$ is

A 1

B 2

C 1 1/8

D 2 1/8

Correct Ans : **B**

Q72
: If two sides of a triangle are the roots of the equation $4x^2-(2\sqrt{6})x+1=0$ and the included angle is 60^0, then the third side is

A $\sqrt{3}$

B $\sqrt{3}/2$

C $\frac{1}{\sqrt{3}}$

D $2\sqrt{3}$

Correct Ans : **B**

Q73
: The inverse of the function $f(x)=\frac{e^x-e^{-x}}{e^x+e^{-x}}+2$ is given by

A $\log_e\left(\frac{x-2}{x+2}\right)^{1/2}$

B $\log_e\left(\frac{x-1}{x+1}\right)^{1/2}$

C $\log_e\left(\frac{1-x}{x-3}\right)^{1/2}$

D $\log_e\left(\frac{x-1}{x+1}\right)^{1/3}$

Correct Ans : **C**

Q74 : If $f(x)=\begin{cases}1+x & 0\le x\le 2\\ 3-x & 2<x\le 3\end{cases}$ then f[f(x)] is

A $f[f(x)]=\begin{cases}2+x & 0\le x\le 1\\ 2-x & 1<x\le 2\\ 4-x & 2<x\le 3\end{cases}$

B $f[f(x)]=\begin{cases}2+x & -1\le x\le 1\\ 2-x & 1<x\le 2\\ 4-x & 2<x\le 3\end{cases}$

C $f[f(x)]=\begin{cases}2+x & 0\le x\le 1\\ 2-x & 1\le x\le 2\\ 4-x & 1\le x\le 3\\ x & 0\le x\le 1\end{cases}$

D $f[f(x)]=\begin{cases}2+x & -1\le x\le 1\\ 2-x & 1<x\le 2\\ 4-x & 2\le x<3\end{cases}$

Correct Ans : **A**

Q75 The points representing the complex numbers Z for which $|Z+4|^2 - |Z-4|^2 = 8$ lie on **:**

A A straight line paralle to x - axis

B A straight line parallel to y - axis

C A circle with centre as origin

D A circle with centre other than the origin

Correct Ans : **B**

Q76 : If $i=\sqrt{-1}, then\ 4+5\left(\frac{-1}{2}+\frac{i\sqrt{3}}{2}\right)^{334}+3\left(\frac{-1}{2}+\frac{i\sqrt{3}}{2}\right)^{265}$ is equal to

A $1-i\sqrt{3}$

B $-1+i\sqrt{3}$

C $i\sqrt{3}$

D $-i\sqrt{3}$

Correct Ans : **C**

Q77 Number of integral values of x satisfying $x^2 - 4x - 21 > 0$ and $x^2 - 9x + 8 < 0$ is :

A one

B two

C many

D nil

Correct Ans : **D**

Q78 If A is a non-singular matrix such that $AA^T = A^TA$ and $B = A^{-1}A^T$, then matrix B is :

A scalar

B orthogonal

C idempotent

D diagonal

Correct Ans : **B**

Q79 : If $A + B = \begin{pmatrix} 2 & -4 \\ 4 & 0 \end{pmatrix}$ and $3B = \begin{pmatrix} -9 & 6 \\ 3 & 12 \end{pmatrix}$ then A + 4B is

A $\begin{pmatrix} -7 & 2 \\ 1 & 12 \end{pmatrix}$

B $\begin{pmatrix} 11 & 10 \\ 7 & 12 \end{pmatrix}$

C $\begin{pmatrix} -11 & -10 \\ 7 & 12 \end{pmatrix}$

D $\begin{pmatrix} -7 & 2 \\ 7 & 12 \end{pmatrix}$

Correct Ans : **D**

Q80 : If I is the unit matrix of order n, where $K \neq 0$ is a constant, then adj(KI) =

A K^n (adj I)

B K (adj I)

C K^2 (adj I)

D K^{n-1} (adj I)

Correct Ans : **D**

Q81 : If $\Delta_1 = \begin{vmatrix} x & b & b \\ a & x & b \\ a & a & x \end{vmatrix}$ and $\Delta_2 = \begin{vmatrix} x & b \\ a & x \end{vmatrix}$, then $\frac{d}{dx}(\Delta_1)$ is equal to

A $3(\Delta_2)^2$

B $3(\Delta_2)^{1/2}$

C $3\Delta_2$

D $3\Delta_2^2$

Correct Ans : **C**

Q82 : $\frac{1}{2.5} + \frac{1}{5.8} + \frac{1}{8.11} + \ldots + \frac{1}{(3n-1)(3n+2)}$ is equal to

A $\frac{n}{3n+2}$

B $\frac{n}{5n+4}$

C $\frac{n}{6n+2}$

D $\frac{n}{6n+4}$

Correct Ans : **D**

Q83 : How many positive integers n can be formed using the digits 3,4,4,5,5,6,7, if n has to exceed 50,00,000?

A 360

B 180

C 320

D 720

Correct Ans : **D**

Q84 : Let f:R$\rightarrow$R be defined by $f(x) = \begin{cases} k - 2x, x \leq -1 \\ 2x + 3, x > -1 \end{cases}$. If f(x) has a local minimum at x=-1, then a possible value of k is

A 0

B -1/2

C -1

D 1

Correct Ans : **C**

Q85 : $\lim_{x \to \infty} \left(\frac{x^2 + 5x + 3}{x^2 + x + 3} \right)^{1/x}$ is

A e^4

B e^2

C e^3

D 1

Correct Ans : **A**

Q86 : $\lim_{x \to \infty} \left(\frac{x}{2 + x} \right)^{2x}$

Find

A e^{-4}

B e^4

C ∞

D 0

Correct Ans : **A**

Q87 : A missile fired from ground level rises x metres vertically upwards in 't' seconds and x = t(100-12.5t). Then the maximum height reached by the missile is

A 100 m

B 150 m

C 250 m

D 200 m

Correct Ans : **D**

Q88 : If $\left(\int_0^a x \, dx \right) \leq (a + 4)$, then

A $0 \leq a \leq 4$

B $-2 \leq a \leq 4$

C $-2 \le a \le 0$

D $a \le -2 \text{ or } a \ge 4$

Correct Ans : **B**

Q89 : $\int \frac{dx}{\cos x - \sin x}$ is equal to

A $\frac{1}{\sqrt{2}} \log\left|\tan\left(\frac{x}{2} - \frac{\pi}{8}\right)\right| + C$

B $\frac{1}{\sqrt{2}} \log\left|\cot\left(\frac{x}{2}\right)\right| + C$

C $\frac{1}{\sqrt{2}} \log\left|\tan\left(\frac{x}{2} - \frac{3\pi}{8}\right)\right| + C$

D $\frac{1}{\sqrt{2}} \log\left|\tan\left(\frac{x}{2} + \frac{3\pi}{8}\right)\right| + C$

Correct Ans : **D**

Q90 : $\int \sec x \, dx$ is

A $\log(\sec x + \tan x) + c$

B $\log \sec x + c$

C $\log \tan x + c$

D $(\sec x + \tan x) + c$

Correct Ans : **A**

Q91 : The value of the integral $\int_3^6 \frac{\sqrt{x}}{\sqrt{9-x} + \sqrt{x}} dx$ is

A 3/2

B 2

C 1

D 1/2

Correct Ans : **A**

Q92 : The line 4x+6y+9=0 touches y^2=4x at the point

A (-3,9/4)

B (-3,-9/4)

C (9/4,-3)

D (-9/4,-3)

Correct Ans : **C**

Q93 The circles $x^2 + y^2 - 4x - 6y - 12 = 0$ and $x^2 + y^2 + 6x - 8y + 21 = 0$ **:**

A intersect at two points

B touches each other externally

C touches each other internally

D neither touches nor intersects

Correct Ans : **A**

Q94 *ABCD* is a square *A* = (1,2), *B* = (3,-4). If line *CD* passes through (3,8) then midpoint of *CD* is **:**

A (2,6)

B (6,2)

C (2,5)

D (24/5, 1/5)

Correct Ans : **D**

Q95 The eccentricity of a circle *e* is **:**

A 0

B 1

C $\sqrt{2}$

D less than 1

Correct Ans : **A**

Q96 : The equation of the second degree $x^2 + 2\sqrt{2xy} + 2y^2 + 4x + 4\sqrt{2y} + 1 = 0$ represents a pair of straight lines, the distance between them is

A 4

B $\frac{4}{\sqrt{3}}$

C 2

D $2\sqrt{3}$

Correct Ans : **C**

Q97 If the circles $x^2 + y^2 + 2x + 2ky + 6 = 0$, $x^2 + y^2 + 2ky + k = 0$ intersect orthogonally, then k **:** is

A $2\,(or)\frac{-3}{2}$

B $-2\,(or)\frac{-3}{2}$

C $2\,(or)\frac{3}{2}$

D $-2\,(or)\frac{3}{2}$

Correct Ans : **A**

Q98 : Consider points A,B,C and D with position vectors $7\vec{i}-4\vec{j}+7\vec{k}, \vec{i}-6\vec{j}+10\vec{k}, -\vec{i}-3\vec{j}+4\vec{k}$ and $5\vec{i}-\vec{j}+5\vec{k}$ respectively, then ABCD is a

A square

B rhombus

C rectangle

D parallelogram

Correct Ans : **B**

Q99 : The centre and radius of the sphere $|2\vec{r}=(J\vec{i}-\vec{j}+4\vec{k})|=4$ are _____

A $\left(\frac{-3}{2},\frac{1}{2},-2\right)$ and 4

B $\left(\frac{-3}{2},\frac{1}{2},-2\right)$ and 2

C $\left(\frac{-3}{2},\frac{1}{2},-2\right)$ and 6

D $\left(\frac{-3}{2},\frac{1}{2},-2\right)$ and 5

Correct Ans : **B**

Q100 : The coefficient of skewnes of a distribution is 0.32. If its standard deviation is 6.5 and mean is 29.6, then the mode of the distribution is given by

A 28.48

B 27.52

C 30.46

D 32.14

Correct Ans : **B**

Q101 : A box contains 5 red and 4 white balls. Two balls are drawn successively from the box without replacement and it is noted that the second one is white. Then the probability that the first one is white is

A 1/6

B 5/6

C 1/2

D 1/9

Correct Ans : **A**

Q102 : If a,b,c are in AP, then $a^3+c^3-8b^3$ is equal to

A 2abc

B 4abc

C 6abc

D 8abc

Correct Ans : **C**

Q103 : In a G.P if the $(m+n)^{th}$ term is p and $(m-n)^{th}$ term is q then its m^{th} term is

A -1

B pq

C $\sqrt{pq}$

D $\frac{1}{2}(p+q)$

Correct Ans : **C**

Q104 : Find the 4^{th} term in the expansion of $(-3a - b)^5$

A $9a^2b^3$

B $30a^2b^3$

C $-90a^2b^3$

D $90a^2b^3$

Correct Ans : **D**

Q105 : If the p^{th}, q^{th}, r^{th} terms of an A.P are in G.P, then the common ratio of the G.P is

A $\frac{pr}{q^2}$

B $\frac{r}{p}$

C $\frac{q+r}{p+q}$

D $\frac{q-r}{p-q}$

Correct Ans : **D**

Q106 Which of the followings are the metabolic products of glucose and glutamine?
:

A CO_2 and NH_3

B CO_2 and lactate

C Lactate and ammonium

D Lactate only

Correct Ans : **C**

Q107 The visual display of chromosomes arranged by size, shape and banding pattern is called as
:

A Syndrome

B Karyotype

C Metaphase spread

D Ploidy

Correct Ans : **B**

Q108 The Dihybrid test cross ratio is
:

A 9:3:2:1

B 9:3:2:2

C 1:1:1:1

D 9:3:3:1

Correct Ans : **C**

Q109 _____ is the term used to refer to the use of bio-resources by multinational companies and other organizations without proper authorization from the countries and people concerned without compensatory payment
:

A Plagiarism

B Piracy

C Biopatents

D Biopiracy

Correct Ans : **D**

Q110 : Floral characters such as single whorl of perianth or no perianth and unisexual flowers pollinated by wind were considered as primitive characters in _____ system of classification

A Natural

B Artificial

C Phylogenetic

D Botanical

Correct Ans : **C**

Q111 : Match the following with respect to the morphology of the leaf

i	Simple	a. *Zornia diphylla*
ii	Bifoliate	b. *Clitoria ternatea*
iiii	Trifoliate	c. *Lablab purpureus*
iv	Compound	d. *Crotalaria juncea*

A d, a, c, b

B a, d, c, d

C a, d, c, b

D b, c, d, a

Correct Ans : **A**

Q112 : Differentiation is change of tissues from_____.

A meristematic to permanent

B simple to complex

C complex to simple

D permanent to meristematic

Correct Ans : **A**

Q113 : Match the following

i.	Chlorenchyma	a.	*Nymphaea*
ii.	Aerenchyma	b.	*Canna*
iii.	Storage parenchyma	c.	All green parts
iv.	Stellate parenchyma	d.	Potato

A d, a, b, c

B a, b, c, d

C d, c, b, a

D c, a, d, b

Correct Ans : **D**

Q114 : The tissue generally present in all organs of plant is _____

A parenchyma

B chlorenchyma

C collenchyma

D sclerenchyma

Correct Ans : **A**

Q115 plasma membrane is
:

A Semipermeable and symmetric

B Selectively permeable, elastic and asymmetric

C Permeable and asymmetric

D Selective permeable with monolayer phospholipids

Correct Ans : **B**

Q116 Eukaryotes differ from Prokaryotes in mechanism of DNA replication due to
:

A Different enzyme for synthesis of lagging and leading strand

B Use of DNA Primer rather than RNA primer

C Unidirectional rather than bidirectional replication

D Discontinuous rather than semi discontinuous replication

Correct Ans : **D**

Q117 The equipment which introduces DNA into cells is
:

A laser

B DNA probe

C gene gun

D needle

Correct Ans : **C**

Q118 Restriction endonucleases
:

A Are used for invitro DNA synthesis

B Are synthesized by bacteria as part of defense mechanism

C Are present in mammalian cells for degradation of DNA when the cells dies

D Are used in genetic engineering for ligating two DNA molecules

Correct Ans : **B**

Q119 Zeatin isolated from
:

A Rice

B Wheat

C Agrobacterium

D Maize

Correct Ans : **D**

Q120 An example of C4 plant is
:

A Coconut

B Mango

C Rice

D Sugarcane

Correct Ans : **D**

Q121 The rate of growth of plants can be measured by a
:

A Manometer

B Auxanometer

C Photometer

D Thermometer

Correct Ans : **B**

Q122 Which of the following is not a C4 plant?
:

A Maize

B *Tribulus*

C Amaranthus

D Wheat

Correct Ans : **D**

Q123 Dark respiration is the function of
:

A peroxisomes

B mitochondria

C chloroplast

D ribosomes

Correct Ans : **B**

Q124 Genetically modified crops can be produced by
:

A somatic hybridisation

B recombinant DNA technology

C crossbreeding

D micropropagation

Correct Ans : **B**

Q125 Maximal application of animal cell culture techniques is in the production of :

A Insulin

B Edible protein

C Vaccines

D Interferons

Correct Ans : **C**

Q126 The most quickly available source of nitrogen to plants are :

A amide fertilizers

B ammonia fertilizers

C nitrate fertilizers

D ammonia nitrate fertilizer

Correct Ans : **C**

Q127 One of the major difficulties in the biological control of insect pest is that :

A the method is less effective as compared with the use of insecticides

B the practical difficulty of introducing the predator to specific areas

C the predator develops a preference to other diets and may itself become a pest

D the predator does not always survive when transferred to a new environment

Correct Ans : **D**

Q128 The backflow of blood into right auricle during ventricular systole is regulated by :

A Tricuspid valve

B Mitral valve

C Semilunar valve

D Aortic valve

Correct Ans : **A**

Q129 RBC placed in 0.9 1.5% Nacl solution, its volume :

A Increases

B Decreases

C Unchanged

D Insufficient information

Correct Ans : **A**

Q130 Right auricle of the mammalian heart release blood through
:

A Tricuspid valve

B Vena cava

C Pulmonary valve

D Mitral valve

Correct Ans : **A**

Q131 Chronic Obstructive Lung Disease (COLD) is a condition due to
:

A Common Viral Infection

B Chronic Bronchitis & Emphysema

C Untreatable bacterial Infection

D Acute Bronchitis with inflammation

Correct Ans : **B**

Q132 Digested food material is absorbed and taken to liver by
:

A Hepatic portal vein

B Hepatic portal artery

C Renal vein

D Renal artery

Correct Ans : **A**

Q133 A genetically engineered microorganism used successfully in bioremediation of oil spills is a species of
:

A *Trichoderma*

B *Bacillus*

C *Xanthomonas*

D *Pseudomonas*

Correct Ans : **D**

Q134 First vitamin to be produced through fermentation process using a wild bacterium was
:

A Vitamin D

B Vitamin C

C Vitamin B2

D Vitamin B12

Correct Ans : **B**

Q135 The following are true about culture media for microbes:
:

A Lowensten-Jensen medium is used to isolate mycobacteria

B Thioglycolate broth allows only anaerobes to grow

C MacConkey agar prevents the growth of Gram negative bacteria

D Sabouraud's culture is useful for culturing bacterial infection

Correct Ans : **A**

Q136 Lysozyme :
:

A Splits peptidoglycan

B Is a cytoplasmic organelle

C Is a proteolytic enzyme

D Activates complement proteins

Correct Ans : **A**

Q137 Which of the following waste include mixture of biodegradable and non biodegradable waste?
:

A food waste

B metallic waste

C mining waste

D municipal waste

Correct Ans : **D**

Q138 Acid rain mainly result from
:

A Sulfur dioxide

B Carbon dioxide

C Carbon monoxide

D Ammonia

Correct Ans : **A**

Q139 Animal pharming can be defined as
:

A Growing animals for farming

B Generating transgenic animals for farming

C Programming animals to produce novel products

D Treatment for farming animals

Correct Ans : **C**

Q140 Dinosaurs were abundant in
:

A Jurassic period

B Devonian period

C Permian period

D Pleistocene period

Correct Ans : **A**