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## SRMJEEE 2017 Question Paper with Answer Key

SRM Joint Engineering Entrance Examination - SRMJEEE

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**Q1 :** \_\_\_\_\_ system of units was accepted by the scientist of the general conference on weights and measures.

- A FPS
- B CGS
- C MKS
- D SI

Correct Ans : **D**

**Q2 :** The SI unit of gravitational constant is \_\_\_\_\_

- A Nm kg
- B  $\text{Nm}^2 \text{kg}^{-2}$
- C  $\text{Nm}^2 \text{kg}$
- D  $\text{N}^{-1} \text{m}^{-2} \text{kg}$

Correct Ans : **B**

**Q3 :** A Circular disc is rotating with angular velocity  $\omega$ . A man standing at the edge walks towards the centre of the disc then the angular velocity  $\omega$ .

- A Decreases
- B Increases
- C No change
- D Halved

Correct Ans : **B**

**Q4 :** For ordinary terrestrial experiments, the observer in an inertial frame in the following cases is

- A giant revolving in giant wheel
- B a driver in sports car moving with constant speed of 200 km / h on a straight road
- C the pilot of an aeroplane which is taking off
- D a cyclist negotiating a sharp curve

Correct Ans : **B**

**Q5 :** The two factors on which the momentum of a body depends are \_\_\_\_\_ and \_\_\_\_\_ .

- A Velocity, time
- B Mass, weight
- C Mass, distance
- D Mass, velocity

Correct Ans : **D**

**Q6 :** Two forces of magnitude 5 N and 10 N act on a wooden block of mass 2 kg. If 5 N force acts towards right and 10 N force acts towards left, which one of following statements is correct?

- A Resultant force is 15 N towards left.
- B Resultant force is 15 N towards right.

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C Resultant force is 5 N towards right.

D Resultant force is 5N towards left.

Correct Ans : D

Q7 : What is the dimension of stress?

A  $MLT^{-2}$

B  $ML^{-1}T^{-2}$

C  $MLT^{-1}$

D  $M^{-1}LT^{-1}$

Correct Ans : B

Q8 : If the temperature of a liquid is raised, then its surface tension is \_\_\_\_\_

A decreased

B increased

C does not change

D equal to viscosity

Correct Ans : A

Q9 : Equal masses of two substances of densities  $\rho_1$  and  $\rho_2$  are mixed together. The density of the mixture would be

A  $\frac{1}{2}(\rho_1 + \rho_2)$

B  $\sqrt{\rho_1\rho_2}$

C  $\frac{\rho_1\rho_2}{\sqrt{(\rho_1\rho_2)}}$

D  $\frac{2\rho_1\rho_2}{(\rho_1 + \rho_2)}$

Correct Ans : D

Q10 : For aluminium the bulk modulus of elasticity is  $7.5 \times 10^{10}$  N/m<sup>2</sup> and density is  $2.7 \times 10^3$  kg/m<sup>3</sup>. The velocity of longitudinal waves in aluminium is

A 2.63 m/s

B  $5.27 \times 10^3$  m/s

C  $10.5 \times 10^3$  m/s

**D** 7.5 ~~X~~  $10^3$  m/s

Correct Ans : **B**

**Q11** Which of the following does not show polarization?

:

- A** Transverse wave in gas
- B** Longitudinal in gas
- C** Longitudinal in solids
- D** Transverse wave in liquids

Correct Ans : **B**

**Q12** The end correction for the vibrations of air column in a tube of circular cross-section will be

: more if the tube is,

- A** reduced in length
- B** increased in length
- C** made thinner
- D** indexed

Correct Ans : **D**

**Q13** A given mass of a gas is at pressure P and absolute temperature T. The isothermal bulk

: modulus of the gas is

- A** P
- B**  $\frac{2}{3}$  P
- C**  $\frac{3}{2}$  P
- D** 2P

Correct Ans : **A**

**Q14** A spherical black body of radius 12cm radiates 450W power at 500K. If the radius is one half

: and the temperature doubled, the power radiated in watt will be

- A** 225
- B** 450
- C** 900
- D** 1800

Correct Ans : **D**

**Q15** The expression for the efficiency of a carnot's engine is

:

- A**  $1 - (T_1/T_2)$
- B**  $1 - T$
- C**  $(T_2/T_1) - 1$
- D**  $1 - (T_2/T_1)$

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Correct Ans : **D**

**Q16** Which of the following is adiabatic gas equation?

:

- A  $PV = \text{Const}$
- B  $PV^\gamma = \text{Const}$
- C  $PV^{\gamma-1} = \text{Const}$
- D  $P \propto 1/V$

Correct Ans : **B**

**Q17** \_\_\_\_\_ is defined as the angle of incidence in the denser medium for which the corresponding angle of refraction in the rarer medium is  $90^\circ$

- A critical angle
- B shearing angle
- C polarising angle
- D dip angle

Correct Ans : **A**

**Q18** The velocity of light in vacuum is \_\_\_\_\_

:

- A  $\sqrt{\mu_0 \epsilon_0}$
- B  $\frac{1}{\sqrt{\mu_0 \epsilon_0}}$
- C  $\mu_0 \epsilon_0$
- D  $\frac{1}{\mu_0 \epsilon_0}$

Correct Ans : **B**

**Q19** The line joining the pole of the mirrors and its centre of curvature is called \_\_\_\_\_

:

- A Principal focus
- B Principal axis
- C Radius of curvature
- D Optic axis

Correct Ans : **D**

**Q20** Light of wavelength  $5500 \text{ \AA}$  from narrow slit is incident on a double slit. The overall separation of 5 fringes on a screen 200 cm away is 1 cm. Calculate slit separation.

- A 0.055 cm

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**B** 0.055 m

**C** 0.55 cm

**D** 0.55 m

Correct Ans : **A**

**Q21** The core used in a transformer is laminated in order to  
:

**A** increase magnetic field

**B** increase residual magnetism

**C** decrease the eddy currents in the core

**D** increase the eddy currents in the core

Correct Ans : **C**

**Q22** In a superconductor, critical magnetic field  
:

**A** increases if temperature decreases

**B** does not depend on temperature

**C** increases if temperature increases

**D** remains constant

Correct Ans : **A**

**Q23** A wire is cut into 4 pieces, which are put together side by side to obtain one conductor. If the  
: original resistance of the wire was R, the resistance of the bundle will be:

**A** R/4

**B** R/8

**C** R/16

**D** R/32

Correct Ans : **C**

**Q24** Magnetic lines of force \_\_\_\_\_  
:

**A** can not intersect at all

**B** intersect within the magnet

**C** intersect only at south and north poles

**D** intersect at neutral point only

Correct Ans : **A**

**Q25** In ruby laser, some of aluminium ions are ( $Al^{3+}$ )replaced by  
:

**A** Copper ions ( $Cu^{3+}$ )

**B** Chromium ions ( $Cr^{3+}$ )

**C** Calcium ions( $Ca^{3+}$ )

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**D** None

Correct Ans : **B**

**Q26** Special theory of relativity treats problem involving  
:

**A** Inertial frame of reference

**B** Non- inertial frame of reference

**C** Non- accelerated frame of reference

**D** Accelerated frame of reference

Correct Ans : **A**

**Q27** The time interval between two event in a reference frame which is in motion is  
:

**A** Maximum

**B** Minimum

**C** No interval

**D** None

Correct Ans : **A**

**Q28** According to theory of relative mass of an object is  
:

**A** Depends on particles

**B** Speed of light

**C** Volume of object

**D** Area of object

Correct Ans : **B**

**Q29** The nucleus which is an isotope of  $C_{17}$  and also an isobar of  $Ar_{18}$  has mass number A and  
: atomic number Z given by \_\_\_\_\_

**A**  $A = 35, Z = 18$

**B**  $A = 37, Z = 17$

**C**  $A = 39, Z = 17$

**D**  $A = 37, Z = 19$

Correct Ans : **C**

**Q30** Which source is associated with line emission spectrum?  
:

**A** electric fire

**B** red traffic light

**C** neon street lite

**D** sun

Correct Ans : **B**

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**Q31** Plutonium decays with half time 24000 yr. If plutonium is stored after 72000 yr, the fraction of it that remains \_\_\_\_\_

- A** 1/2
- B** 1/9
- C** 1/12
- D** 1/8

Correct Ans : **D**

**Q32** If a 46 gm golf ball has velocity 36 m/s and an electron with velocity  $10^7$  m/s. Which of these two show wave character?

- A** Electron
- B** Golf ball
- C** Both electron and golf ball
- D** Both do not show wave character

Correct Ans : **A**

**Q33** What is the net charge if a certain semiconductor losses 4 valence electrons?

- A** +4
- B** -4
- C** +8
- D** -8

Correct Ans : **A**

**Q34** If the feedback fraction of an amplifier is 0.01, then voltage gain with negative feedback is approximately \_\_\_\_\_

- A** 500
- B** 100
- C** 1000
- D** 5000

Correct Ans : **B**

**Q35** Electromagnetic waves transport

- A** Wavelength
- B** Charge
- C** Frequency
- D** Energy

Correct Ans : **D**



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**Q36** The pykometric density of sodium chloride crystal is  $2.165 \times 10^3 \text{ kg m}^{-3}$  while its X-ray density is  $2.178 \times 10^3 \text{ kg m}^{-3}$ . The fraction of the unoccupied sites in sodium chloride crystal is

- A 5.96
- B  $5.96 \times 10^{-1}$
- C  $5.96 \times 10^{-2}$
- D  $5.96 \times 10^{-3}$

Correct Ans : **D**

**Q37** The sharp melting point of a crystalline solid is due to

:

- A Regular arrangement of constituent particles observed over a short distance in the crystal lattice
- B Regular arrangement of constituent particles observed over a long distance in the crystal lattice
- C Same arrangement of constituent particles in different directions
- D Different arrangement of constituent particles in different directions

Correct Ans : **B**

**Q38** The de Broglie wavelengths of electron waves in two orbits is 3:5. The ratio of kinetic energy of electrons will be

- A 3:5
- B 5:3
- C 25:9
- D 9:25

Correct Ans : **C**

**Q39** Which of the following is atypical element?

:

- A Li
- B Na
- C F
- D N

Correct Ans : **C**

**Q40** Which one of the following sets of elements has the strongest tendency to form negative ions in gaseous state?

- A Na, Mg, Al
- B Ca, V, Cr
- C N, O, F
- D Ga, In, Tl

Correct Ans : **C**

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**Q41** The correct order of second ionization potential of carbon, nitrogen, oxygen and fluorine is :

- A**  $C > N > O > F$
- B**  $O > N > F > C$
- C**  $O > F > N > C$
- D**  $F > O > N > C$

Correct Ans : **C**

**Q42** A neutral atom (Atomic number  $> 1$ ) consists of :

- A** Only protons
- B** Neutrons + protons
- C** Neutrons + electrons
- D** Neutrons + proton + electrons

Correct Ans : **D**

**Q43** The total number of electrons that can be accommodated in the fourth principal energy level is \_\_\_\_\_

- A** 2
- B** 8
- C** 18
- D** 32

Correct Ans : **D**

**Q44** 0.0025 has \_\_\_\_\_ significant figure :

- A** 1
- B** 2
- C** 3
- D** 4

Correct Ans : **B**

**Q45** The values of four quantum numbers of valence electron of an element are  $n = 4$ ,  $l = 0$ ,  $m = 0$  and  $s = +1/2$ . The element is :

- A** Na
- B** K
- C** Ti
- D** Sc

Correct Ans : **B**

**Q46** The molecular formula of dithionic acid is :

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A  $\text{H}_2\text{S}_2\text{O}_4$

B  $\text{H}_2\text{S}_2\text{O}_6$

C  $\text{H}_2\text{S}_2\text{O}_5$

D  $\text{H}_2\text{S}_2\text{O}_7$

Correct Ans : **B**

**Q47** Which of the following species has the maximum bond order?

:

A  $\text{O}_2$

B  $\text{O}_2^-$

C  $\text{O}_2^{2-}$

D  $\text{O}_2^+$

Correct Ans : **D**

**Q48** The least metallic of the S block element is

:

A Be

B Li

C Mg

D Na

Correct Ans : **A**

**Q49** The relationship between equilibrium constant K and free energy change of the process is given

by

A  $\Delta G = -RT \log K$

B  $\Delta G^\circ = RT \log 1/K$

C  $\Delta G^\circ = 2RT \log K$

D  $\Delta G^\circ = 2.303 RT \log K^{-1}$

Correct Ans : **D**

**Q50** Which of the following salt will have same value of Vant Hoff's factor, 'i' as that of  $\text{K}_4[\text{Fe}(\text{CN})_6]$ ?

:

A  $\text{Al}_2(\text{SO}_4)_3$

B NaCl

C  $\text{Al}(\text{NO}_3)_3$

D  $\text{Na}_2\text{SO}_4$

Correct Ans : **A**

**Q51** Identify the correct statement regarding a spontaneous process

:

A For a spontaneous process in an isolated system, the change in entropy is positive

B Endothermic processes are never spontaneous

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- C Exothermic processes are always spontaneous
- D Lowering of energy in the reaction process is the only criterion for spontaneity

Correct Ans : **A**

**Q52** Osmotic pressure is a colligative property because it

:

- A Depends on the number of solution particles and not on its nature
- B Depends on the identify of the solute and not on its number
- C Depends both nature and number of solute particles
- D Is independent of nature and number of solute particles

Correct Ans : **A**

**Q53** According to Henry's law, the volume of a gas dissolved in a solvent at a given temperature is

:

- A dependent of pressure
- B independent of concentration
- C dependent of concentration
- D independent of pressure

Correct Ans : **D**

**Q54** The correct order of increasing basicity of the given conjugate bases ( $R = CH_3$ ) is

:

- A  $RCOO^- < HC\equiv C^- < R^- < NH_2^-$
- B  $R^- < HC\equiv C^- < RCOO^- < NH_2^-$
- C  $RCOO^- < NH_2^- < HC\equiv C^- < R^-$
- D  $RCOO^- < HC\equiv C^- < NH_2^- < R^-$

Correct Ans : **D**

**Q55** Phenolphthalein can be used to determine  $p^H$  over the range of

:

- A 0-2
- B 2-4
- C 4-6
- D 8-10

Correct Ans : **D**

**Q56** When sodium acetate is added to acetic acid, the degree of ionisation of acetic acid

:

- A increases
- B decreases
- C does not change
- D becomes zero

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Correct Ans : **B**

**Q57** The rays from the radioactive element which gets deflected to the positive pole under strong electric field are called

- A** alpha rays
- B** beta rays
- C** gamma rays
- D** delta rays

Correct Ans : **B**

**Q58** Which of the following relation between average life period ( $t$ ) and the disintegration constant ( $\lambda$ ) and the disintegration constant ( $\lambda$ ) of the radio element is correct

- A**  $t = 1/\lambda$
- B**  $t = \lambda$
- C**  $t = -\lambda$
- D**  $t\lambda = 0$

Correct Ans : **A**

**Q59** In paper chromatography, the stationary and mobile phases are

- A** both liquids
- B** solid and liquid respectively
- C** liquid and solid respectively
- D** both solids

Correct Ans : **A**

**Q60** Process in which solid is directly converted to vapors state is called

- A** Filtration
- B** Distillation
- C** Solvation
- D** Sublimation

Correct Ans : **D**

**Q61** If a bond breaks in such a way that both electrons remain with one fragment, the mechanism is called

- A** Heterolytic
- B** Homolytic
- C** Electrocyclic
- D** Pericyclic

Correct Ans : **A**

**Q62** The isocyanates obtained in the reaction of Hoffman, Curtius, Lossen and Schimdt. Hydrolysed  
: to give

- A Amides
- B Amines
- C Acids
- D Cyanides

Correct Ans : **B**

**Q63** Olefin means

:

- A ethene
- B unsaturated
- C oil forming
- D having tripple bond

Correct Ans : **C**

**Q64** Select the substance which has only one

: Pi ( $\pi$ ) bond in its molecule.

- A Acetylene
- B Acrolein
- C Propene
- D 2-Butenoic acid

Correct Ans : **C**

**Q65** Which of the following reagents can convert acetone to acetic acid?

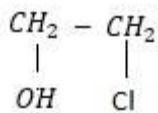
:

- A  $\text{AgNO}_3$  ;  $\text{NH}_4\text{OH}$
- B  $\text{LiAlH}_4$
- C Conc.  $\text{HCl}$
- D  $\text{I}_2$  ,  $\text{NaOH}$ ; dilute  $\text{HCl}$

Correct Ans : **D**

**Q66**

:



on boiling with  $\text{NaOH}$  gives

- A Ethanal
- B Ethanol
- C Glycol
- D 2 - propanone

Correct Ans : **C**

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**Q67** Gabriel's phthalimide reaction is used for the synthesis of

:

- A** aromatic 1° amines
- B** aliphatic 1° amines
- C** aromatic 2° amines
- D** aliphatic 2° amines

Correct Ans : **B**

**Q68**  $\text{RMgX} + \text{CN Cl} \rightarrow \text{X}$ . X is

:

- A** NCO
- B** NC
- C** CN
- D**  $\text{Cl}^-$

Correct Ans : **C**

**Q69** Butadiene and styrene undergoes joint polymerization to form

:

- A** SBR rubber
- B** Neoprene
- C** Thiokol
- D** Hypalon

Correct Ans : **A**

**Q70** What are the structural units of proteins?

:

- A** Amylopectin
- B** Equal portion of sugar and amino acids
- C** Amino acids
- D** Glucose

Correct Ans : **C**

**Q71** In a town of 1000 families it was found that 40% families buy India Today, 20% families buy 'Frontline' and 10% families buy the week. 5% buy India today and frontline, 3% buy Frontline and the Week and 4% buy the Week and India Today. If 2% families buy all the 3 magazines, the number of families which buy Frontline only is

- A** 330
- B** 140
- C** 300
- D** 200

Correct Ans : **B**

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**Q72** If  $\tan(A + B) = m$  and  $\tan(A - B) = n$  then value of  $\tan 2A$  is :

- A  $\frac{m + n}{1 - mn}$
- B  $\frac{m + n}{1 + mn}$
- C  $\frac{mn}{1 - mn}$
- D  $\frac{mn}{1 + mn}$

Correct Ans : **A**

**Q73**

:

$$f(x) = \frac{\log_2(x + 3)}{x^2 + 3x + 2}$$

The domain of definition of  $f(x)$  is

- A  $R - [0, -2]$
- B  $(-2, \infty)$
- C  $R - \{-1, -2, -3\}$
- D  $(-3, \infty) - (-1, -2)$

Correct Ans : **D**

**Q74**

:

If A and B are two sets such that  $n(A \cup B) = 36$ ,  $n(A \cap B) = 16$  and  $n(A - B) = 15$ , then  $n(B)$  is equal to

- A 21
- B 31
- C 20
- D 52

Correct Ans : **A**

**Q75** If every pair from among the

:

equations  $x^2 + px + qr = 0$ ,  $x^2 + qx + rp = 0$  and  $x^2 + rx + pq = 0$  has a common root then the product of three common roots is

- A pqr
- B 2pqr
- C  $p^2 q^2 r^2$
- D  $\sqrt{pqr}$

Correct Ans : **A**



**Q76** If  $z$  and  $\omega$  are non-zero complex numbers such

:

$$|z\omega| = 1 \text{ and } \arg(z) - \arg(\omega) = \frac{\pi}{2}, \text{ then } \bar{z}\omega$$

that

is equal to

**A** 1

**B** -1

**C**  $i$

**D**  $-i$

Correct Ans : **D**

**Q77**

:

$$\text{If } \left[ \frac{\frac{\sqrt{3}}{2} + \left(\frac{1}{2}\right)i}{\frac{\sqrt{3}}{2} - \left(\frac{1}{2}\right)i} \right]^{120} = p + iq, \text{ then}$$

**A**  $p = \cos 20^\circ, q = \sin 20^\circ$

**B**  $p = -\cos 20^\circ, q = -\sin 20^\circ$

**C**  $p = \cos 20^\circ, q = -\sin 20^\circ$

**D**  $p = 1, q = 0$

Correct Ans : **D**

**Q78**

:

If  $A = \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$  and  $n \in \mathbb{N}$  then  $A^n$  is equal to

**A**  $2^n A$

**B**  $2^{n-1} A$

**C**  $nA$

**D** none of these

Correct Ans : **B**

**Q79**

:

If  $a, b, c$  are sides of a triangle and  $\begin{vmatrix} a^2 & b^2 & c^2 \\ (a+1)^2 & (b+1)^2 & (c+1)^2 \\ (a-1)^2 & (b-1)^2 & (c-1)^2 \end{vmatrix} = 0$  then  $\Delta ABC$  is

**A** equilateral

**B** right angled isosceles

**C** isosceles

**D** right angled

Correct Ans : **C**

**Q80** Which of the following is not elementary transformation?

:

- A**  $R_i \leftrightarrow R_j$   
**B**  $R_i \rightarrow 2R_i + R_j$   
**C**  $C_i \rightarrow C_j + C_i$   
**D**  $R_i \rightarrow R_i + C_j$

Correct Ans : **D**

**Q81**

∴ If  $\Delta = \begin{vmatrix} 1 & 2 & 3 \\ 2 & 5 & 7 \\ 3 & 9 & 13 \end{vmatrix}$  and  $\Delta' = \begin{vmatrix} 7 & 20 & 29 \\ 2 & 5 & 7 \\ 3 & 9 & 13 \end{vmatrix}$  then

- A**  $\Delta' = 3\Delta$   
**B**  $\Delta' = \frac{3}{\Delta}$   
**C**  $\Delta' = \Delta$   
**D**  $\Delta' = 2\Delta$

Correct Ans : **C**

**Q82** How many different signals can be given by using any number of flags from six flags of different colors?

- A** 1236  
**B** 516  
**C** 720  
**D** 1956

Correct Ans : **D**

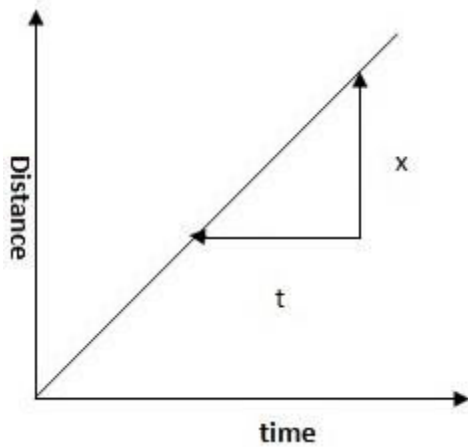
**Q83** If  $\forall n \in \mathbb{N}$ ,

∴ Let  $p(n) = 1 + 3 + 5 + \dots + (2^n - 1) = 3 + n^2$  then which of the following is true?

- A**  $p(1)$  is true  
**B**  $p(k)$  is true  $\Rightarrow p(k + 1)$  is true  
**C**  $p(k)$  is true,  $p(k + 1)$  is not true  
**D**  $p(k)$  is not true  $\Rightarrow p(k + 1)$  is true

Correct Ans : **B**

**Q84** The following graph gives the functional relationship between distance and time of a moving car : in m/sec. The speed of the car is



- A  $x/t$  m/s
- B  $t/x$  m/s
- C  $dx/dt$  m/s
- D  $dt/dx$  m/s

Correct Ans : **A**

**Q85**

:  $\lim_{x \rightarrow \infty} \left( \operatorname{cosec} x - \frac{1}{x} \right) =$

- A 0
- B 1
- C 3
- D 5

Correct Ans : **A**

**Q86**

: The set of points, where  $f(x) = \frac{x}{1 + |x|}$  is differentiable, is:

- A  $(-\infty, -1) \cup (-1, \infty)$
- B  $(-\infty, \infty)$
- C  $(0, \infty)$
- D  $(-\infty, 0) \cup (0, \infty)$

Correct Ans : **B**

**Q87** The angle of intersection of the curves  $y=x^3$  and  $6y=7-x^2$  at  $(1,1)$  is :

- A  $\frac{\pi}{4}$

**B**  $\frac{\pi}{3}$

**C**  $\frac{\pi}{2}$

**D**  $\frac{\pi}{6}$

Correct Ans : **C**

**Q88**

:

If  $[x]$  is the greatest integer function then  $\int_{-2}^2 [x]^3 dx = \underline{\hspace{2cm}}$

**A** 0

**B** -8

**C** -1

**D** -4

Correct Ans : **C**

**Q89**

:

Let  $f(2a - x) = -f(x)$ . then  $\int_0^{2a} f(x) dx =$

**A**  $f(x)$

**B** 0

**C**  $\int_0^a f(x) dx$

**D**  $f(2a - x)$

Correct Ans : **B**

**Q90** The area bounded by  $y = x - 1$  and  $y = 3 - x$  is

:

**A** 2

**B** 3

**C** 4

**D** 1

Correct Ans : **C**

**Q91** The P.I of  $(D^2 + 4)y = \sin h 2x$  is

:

**A**  $y = 1/8 \sin h 2x$

**B**  $y = 1/4 \sin h 2x$

**C**  $y = -1/8 \sin h 2x$

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**D**  $y = -1/4 \sin h 2x$

Correct Ans : **A**

**Q92** A focal chord of the parabola  $y^2 = 8x$  is inclined to x-axis at an angle  $\tan^{-1} 3$ . Then its length is equal to:

**A**  $80/3$

**B**  $80/9$

**C**  $40/3$

**D**  $40/9$

Correct Ans : **B**

**Q93** The length of the intercept made by the circle  $x^2 + y^2 - 12x + 14y + 11 = 0$  on x-axis is :

**A** 6

**B** 10

**C** 8

**D** 4

Correct Ans : **B**

**Q94**

: The equation of the normal to the ellipse  $\frac{x^2}{10} + \frac{y^2}{5} = 1$  at  $(\sqrt{8}, 1)$  is

**A**  $10x + 5y = 1$

**B**  $y = \sqrt{2}(x + 1)$

**C**  $x = \sqrt{2}(y + 1)$

**D**  $y = \sqrt{8}(x + 1)$

Correct Ans : **C**

**Q95** Equation of the parabola whose vertex and focus lie on the axis of x at distances a and  $a_1$  from the origin respectively is

**A**  $y^2 = 4(a_1 - a)x$

**B**  $y^2 = 4(a_1 - a)(x - a)$

**C**  $y^2 = 4(a_1 - a)(x - a_1)$

**D**  $y^2 = 4(a - a_1)x$

Correct Ans : **B**

**Q96** If  $x = -2 + 3 \cos \theta$ ;  $y = 1 + 3 \sin \theta$  then the locus of the point (x,y) is a circle with :

**A** centre at (-2,1) and radius = 3

**B** centre at (2,1) and radius = 3

**C** centre at (2,-1) and radius = 9

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**D** centre at (-2,1) and radius = 9

Correct Ans : **A**

**Q97** If one of the lines  $ax^2+2hxy+by^2=0$  bisects the angle between positive directions of the axes : then a,h,b satisfy the relation

**A**  $a+b=-2h$

**B**  $(a-b)^2=4h^2$

**C**  $a+b=2|h|$

**D**  $(a-b)=2|h|$

Correct Ans : **A**

**Q98** : A unit vector coplanar with  $\vec{i} + \vec{j} + 2\vec{k}$  and  $\vec{i} + 2\vec{j} + \vec{k}$  and perpendicular to  $\vec{i} + \vec{j} + \vec{k}$  is

**A**  $-\vec{j} + \vec{k}$

**B**  $\frac{1}{\sqrt{2}}(-\vec{j} + \vec{k})$

**C**  $\frac{1}{3}(-\vec{j} + \vec{k})$

**D**  $\frac{1}{\sqrt{3}}(-\vec{j} + \vec{k})$

Correct Ans : **B**

**Q99** : If angle between  $\vec{i} - 2\vec{j} + 3\vec{k}$  and  $2\vec{i} + \vec{j} + 3\vec{k}$  is  $\theta$  then  $\sin \theta$  equals

**A**  $\frac{5}{\sqrt{7}}$

**B**  $\frac{5}{21}$

**C**  $\frac{5}{2\sqrt{7}}$

**D**  $\frac{5}{\sqrt{14}}$

Correct Ans : **C**

**Q100** If  $P(A) = 1/3$ ,  $P(B) = 3/4$  and  $P(A \cup B) = 11/12$ , then  $P(A/B)$  is :

**A**  $1/9$

**B**  $1/4$

**C**  $2/9$

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**D** 5/9

Correct Ans : **C**

**Q101** The geometric mean  $3, 3^2, \dots, 3^n$  is :

**A**  $3^{n/2}$

**B**  $3^{(n+1)/2}$

**C**  $3^{n(n+1)/2}$

**D**  $3^n$

Correct Ans : **B**

**Q102** what is the product of three Geometric mean between 4 and  $1/4$  ? :

**A** 0

**B** 1

**C** 2

**D** -1

Correct Ans : **B**

**Q103** If the three successive coefficients in the binomial expansion of  $(1+x)^n$  are 28, 56 and 70 respectively then n equals

**A** 4

**B** 6

**C** 8

**D** 10

Correct Ans : **C**

**Q104** If the sum of first n positive integer is  $1/5$  times the sum of their squares, then n equals :

**A** 5

**B** 6

**C** 7

**D** 8

Correct Ans : **C**

**Q105** The middle term in the expansion of  $(x + 1/x)^{2n}$  is  $1.3.5 \dots (2n-1)/2n!$  :

**A**  $1.3.5 \dots (2n-1)(2n)/n!$

**B**  $1.3.5 \dots (2n-1)/n!.2^n$

**C**  $2n!/n!.2^n$

**D** none of the above

Correct Ans : **B**

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**Q106** Excess CO<sub>2</sub> suppress cell growth and productivity by?

:

- A** inhibiting respiration
- B** changing osmolarity of medium
- C** increasing bacterial contamination
- D** altering pH of the medium

Correct Ans : **A**

**Q107** The size of the chromosome is measured during

:

- A** Interphase
- B** Prophase
- C** Metaphase
- D** Anaphase

Correct Ans : **C**

**Q108** In gene cloning which of the following are used as vehicles for carrying foreign DNA fragment

:

- A** Host cell
- B** Restriction enzymes
- C** Adaptor
- D** Vector

Correct Ans : **D**

**Q109** The total number of cells in a culture is counted using the trypan blue exclusion assay and is found to be  $2.7 \times 10^6$  cells/ml. The culture is diluted 1:27 and then 100  $\mu$ l seeded per well into a 96 well plate. What is the final cell density per well?

- A**  $1 \times 10^5$
- B**  $2.7 \times 10^4$
- C**  $2.7 \times 10^5$
- D**  $1 \times 10^4$

Correct Ans : **D**

**Q110** Family tree can be constructed by

:

- A** Cloning
- B** Karyotyping
- C** DNA sequencing
- D** Pedigree analysis

Correct Ans : **D**



**Q111** The plant having milky latex is  
:

- A** *Phyllanthus emblica*
- B** *Ricinus communis*
- C** *Jatropha curcas*
- D** *Euphorbia tirucalli*.

Correct Ans : **D**

**Q112** Among the following which is tree?  
:

- A** *Phyllanthus amarus*
- B** *Ricinus communis*
- C** *Phyllanthus emblica*
- D** *Euphorbia antiquorum*

Correct Ans : **C**

**Q113** Which among the following members is not economically important as a food?  
:

- A** *Solanum tuberosum*
- B** *Solanum melongena*
- C** *Lycopersicon esculentum*
- D** *Solanum trilobatum*

Correct Ans : **D**

**Q114** Pick the incorrect statement with respect to xylem parenchyma  
:

- A** The cell wall is thin and made up of cellulose
- B** The cells store food reserves
- C** The cells assist in conduction of water
- D** The cells are dead at maturity

Correct Ans : **D**

**Q115** Choose the best option that gives the correct match for the terms given in the columns.

:

Annular	1	Spring
Scalariform	2	Ring
Spiral	3	Uniform
Pitted	4	Ladder

- A** 4 - 3 - 2 - 1
- B** 2 - 4 - 1 - 3
- C** 2 - 3 - 4 - 1
- D** 3 - 4 - 1 - 2

Correct Ans : **B**

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**Q116** The simple type of plant body in which a single cell performs all the vital functions of life is referred to as \_\_\_\_\_

- A** Unicellular
- B** Monocellular
- C** Acellular
- D** Noncellular

Correct Ans : **A**

**Q117** During the formation of periderm, a few layers of meristematic tissue are formed in the cortex. This is called \_\_\_\_\_.

- A** Periderm
- B** Phellem
- C** Phellogen
- D** Phelloderm

Correct Ans : **C**

**Q118** Plant cell wall is made up of \_\_\_\_\_

- A** Cellulose, hemicelluloses and Pectin
- B** Cellulose and Pectin
- C** Cellulose, hemicelluloses and chitin
- D** Cellulose only

Correct Ans : **A**

**Q119** Which of the following pairs of plant parts are both Diploid \_\_\_\_\_

- A** Nucleus and antipodals
- B** Antipodal cells and megaspore mother cells
- C** Synergids and tapetum
- D** Tapetum and sporogenous cells

Correct Ans : **D**

**Q120** If mutation changes codon in such a way that there is no effect on functioning and overall structure of protein. This type of mutation is termed as \_\_\_\_\_

- A** Silent
- B** Mis sense
- C** Transition
- D** Frame shift

Correct Ans : **A**

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**Q121** In tetrad analysis, second-division segregation result from  
:

- A** single crossover between linked genes
- B** double crossover between linked genes
- C** single crossover between a gene and a centromere
- D** independent assortment of unlinked genes

Correct Ans : **C**

**Q122** In man, which of the following genotypes and phenotypes may be the correct result of  
: aneuploidy in sex chromosomes?

- A** 22 pairs + Y females
- B** 22 pairs + XX females
- C** 22 pairs + XXY males
- D** 22 pairs + XXXY females

Correct Ans : **C**

**Q123** The "Golden rice", aimed at curing  
:

- A** Vitamin b deficiency
- B** Vitamin a deficiency
- C** Vitamin k deficiency
- D** Zinc deficiency

Correct Ans : **B**

**Q124** Which of the following enzymes cut the DNA molecule at specific nucleotide sequence  
:

- A** Restriction endonuclease
- B** DNA ligase
- C** RNA polymerase
- D** Exonuclease

Correct Ans : **A**

**Q125** Photorespiration is also known as -----pathway  
:

- A** C<sub>2</sub>
- B** C<sub>3</sub>
- C** C<sub>4</sub>
- D** Carbon reduction

Correct Ans : **A**

**Q126** Growth can be measured by:  
:

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- A** Auxanometer
- B** Horizontal microscope
- C** Crescograph
- D** All of these

Correct Ans : **D**

**Q127** Photorespiration involves  
:

- A** Glycolate cycle
- B** Kreb's cycle
- C** Calvin cycle
- D** CAM cycle

Correct Ans : **A**

**Q128** Which of the following helps in ascent of sap?  
:

- A** Root pressure
- B** Transpiration
- C** Both a and b
- D** Only b

Correct Ans : **D**

**Q129** Seed dormancy allows the plants to  
:

- A** Overcome unfavourable climate conditions
- B** Develop healthy seeds
- C** Reduce viability
- D** Prevent deterioration of seeds

Correct Ans : **A**

**Q130** The plant Drosera is a  
:

- A** saprophytic
- B** insectivorous
- C** parasitic
- D** Endophytes

Correct Ans : **B**

**Q131** One of the following is a source of rubber  
:

- A** Hevea brasiliensis
- B** Tectona grandis

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- C** Cedrus depdara
- D** Michelia champaca

Correct Ans : **A**

**Q132** Isolation and patenting useful genes of other countries without their permission or : understanding is called

- A** Biopatenting
- B** Biopiracy
- C** Bioterrorism
- D** Biowar

Correct Ans : **B**

**Q133** A nitrogen fixing blue green alga is :

- A** Ulothrix
- B** Spirogyra
- C** Anabaena
- D** Rhizobium

Correct Ans : **C**

**Q134** In paddy fields biological nitrogen fixation is chiefly brought by :

- A** Mycorrhiza
- B** Green algae
- C** Cyanobacteria
- D** Rhizobium

Correct Ans : **C**

**Q135** Bacillus thuringiensis (Bt) strains have been used from designing novel :

- A** bio - metallurgical technique
- B** bio - mineralization processes
- C** bio - insecticidal plants
- D** bio - fertilizers

Correct Ans : **C**

**Q136** B lymphocytes are integral part of :

- A** Cell-mediated immunity
- B** Humoral immunity
- C** Innate immunity
- D** Non-specific immunity

Correct Ans : **B**

**Q137** Action potential is generated because of  
:

- A** K ions influx
- B** K ions efflux
- C** Na ions influx
- D** Na ion efflux

Correct Ans : **C**

**Q138** Hypothyroidism in adults leads to  
:

- A** Cretinism
- B** Acromegaly
- C** Grave's disease
- D** Myxoedema

Correct Ans : **D**

**Q139** The auditory ossicle that is attached to the tympanic membrane of external ear is  
:

- A** Auditory meatus
- B** Malleus
- C** Incus
- D** Stapes

Correct Ans : **B**

**Q140** Milk protein casein is broken down into paracasein by  
:

- A** Chymotrypsin
- B** Renin
- C** Chymosin
- D** Trypsin

Correct Ans : **C**

**Q141** Epsilon cells of islet of langerhans in pancreas secrete  
:

- A** Glucagon
- B** Insulin
- C** Ghrelin
- D** somatostatin

Correct Ans : **C**

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**Q142** Auto-immune disorder for cholinergic receptors is  
:

- A** Rheumatic Heart Disease
- B** Multiple Sclerosis
- C** Rheumatoid Arthritis
- D** Myasthenia gravis

Correct Ans : **D**

**Q143** Microbes that inhibit the growth of other microorganisms termed as  
:

- A** Synergism
- B** Mutualism
- C** Parasitism
- D** Antagonism

Correct Ans : **D**

**Q144** A microbial disease that spreads over a very large geographic area is called:  
:

- A** A pandemic
- B** An outbreak
- C** An epidemic
- D** A chronic disease

Correct Ans : **A**

**Q145** Mac-Conkey medium is an example of  
:

- A** Transport medium
- B** Enrichment medium
- C** Differential medium
- D** Simple medium

Correct Ans : **C**

**Q146** Teichoic acids are typically found in  
:

- A** Outer membranes of gram positive bacteria
- B** Cell walls of gram positive bacteria
- C** Cell walls of gram negative bacteria
- D** Outer membranes of gram negative bacteria

Correct Ans : **B**

**Q147** Which of the following does not protect body surfaces:  
:

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- A** Skin
- B** Mucus
- C** Gut microflora
- D** Salivary amylase

Correct Ans : **D**

**Q148** The affinity of an antibody can be determined by measuring :

- A** Its concentration
- B** The valency of antigen binding
- C** The amount of antibody bound at various antigen concentrations
- D** Its ability to neutralize bacterial toxins

Correct Ans : **C**

**Q149** The one thing that is common to all fossil fuels is that they :

- A** were originally formed in marine environment
- B** represent the remains of one living organisms
- C** have undergone the same set of geological processes during their formation
- D** contain carbon

Correct Ans : **D**

**Q150** Steam reforming is currently the least expensive method of producing:

- A** Coal
- B** Biogas
- C** Hydrogen
- D** Natural gas

Correct Ans : **C**

**Q151** Which of the following acts as a natural sun block? :

- A** CFC
- B** ozone
- C** ammonia
- D** oxygen

Correct Ans : **B**

**Q152** 75 to 90 mm of mercury is an adult's normal :

- A** Systolic pressure
- B** Diastolic pressure



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- C** Peristaltic pressure
- D** Water pressure

Correct Ans : **B**

**Q153** Which of these techniques is used for 'virtual endoscopy'?

:

- A** CT scan
- B** ECG
- C** MRI
- D** Ultrasonography

Correct Ans : **A**

**Q154** What is meant by the term fitness according to Darwinism?

:

- A** Ability to survive and reproduce
- B** Healthy appearance
- C** Physical strength
- D** Aggressiveness

Correct Ans : **A**

**Q155** Weismann cut off tails of mice generation after generation but tails neither disappeared nor shortened showing that

- A** Tail is an essential organ
- B** Darwinism was wrong
- C** Lamarckism was wrong
- D** Mutation theory was wrong

Correct Ans : **C**