

**Note:** Biological sciences applicants opt Biology section where as engineering applicants opt Math section from the following.

## SSE TEST 01

### SECTION CHEMISTRY

- The carbohydrate reserve of the body is  
A. Glycogen      B. Cellulose      C. Glucose      D. Starch
- The sugar part of nucleic acid is  
A. Sorbose      B. Formose      C. Glucose      D. Ribose
- In the reaction  $\text{NH}_3 + \text{H}_2\text{O} \rightarrow \text{NH}_4^+ + \text{OH}^-$  which of the following constitute conjugate acid base pair  
A.  $\text{NH}_4^+$  and  $\text{OH}^-$       B.  $\text{H}_2\text{O}$  and  $\text{OH}^-$       C.  $\text{NH}_3$  and  $\text{OH}^-$       D.  $\text{NH}_3$  and  $\text{H}_2\text{O}$
- Neutron possesses  
A. Negative charge      B. Positive charge      C. All are correct      D. No charge
- Total number of orbitals associated with orbit number 3 are  
A. 8      B. 6      C. 4      D. 3
- Which of the following is an example of covalent network solid?  
A. Silicon      B. Sodium chloride      C. Sodium      D. Sodium carbon dioxide
- A device used for the determination of radioactivity is  
A. G.M. Counter      B. Nuclear reactor      C. Cyclotron      D. Mass spectrometer
- Gamma Rays are  
A. Low energy electron      B. High energy proton  
C. High energy electron      D. High energy electromagnetic waves
- Approximate calorific value of lipids is  
A. 20 kcal/g      B. 9 kcal/g      C. 6 kcal/g      D. 4 kcal/g

10. Digestion of starch in a test tube can be demonstrated by adding  
A. Albumin                      B. Diatase                      C. Zymase                      D. Saliva
11. Which of the following ions (radicals) form insoluble compounds with elements of Group IIA of periodic table.  
A. Carbonates                      B. Nitrates                      C. Acetates                      D. Chlorides
12. Spodumene is the mineral of  
A. Lithium                      B. Sodium                      C. Potassium                      D. None
13. Indicate the most viscous liquid in the following.  
A. H<sub>2</sub>O                      B. CH<sub>3</sub>OH                      C. CH<sub>4</sub>                      D. CH<sub>3</sub>OCH<sub>3</sub>
14. Identify the reducing agent in the reaction  $2\text{Mg(s)} + \text{O}_2 \rightarrow 2\text{Mg}^{2+}(\text{s}) + 2\text{O}^{2-}$   
A. O<sup>2-</sup>                      B. Mg<sup>2+</sup>                      C. O<sub>2</sub>                      D. Mg
15. Which is not the mineral of Silicon  
A. Analcite                      B. Asbestos  
C. Dolomite                      D. Zircon
16. Substance that affects the rate of reaction but remains unaltered at the end of the reaction is called  
A. Catalyst                      B. Acid                      C. Base                      D. None of the above
17. If one mole of solute is dissolved in one liter of solution, the solution is called  
A. None of the following                      B. One molal                      C. One molar                      D. One normal
18. If one gram equivalent of a solute is dissolved in one liter of solution, the solution is called  
A. One normal                      B. One Molal                      C. One molar                      D. None of the above
19. At constant temperature, volume of a given mass of a gas is inversely proportional to pressure exerted on it is called  
A. Coulomb's Law                      B. Boyle's Law                      C. General Gas Law                      D. Charles Law
20. The number of atoms or molecules whose concentration determine the rate of reaction is called  
A. Molecularity                      B. Rate of reaction                      C. Order of reaction                      D. None of the above

21. Electrolytes which ionize to a very small extent in a solution are called  
A. Neutral B. Weak electrolytes C. Strong electrolytes D. None of the above
22. The change of concentration of reactants or products in a given time is called,  
A. Order of reaction B. Rate of reaction C. Molecularity D. None of the above
23. Reactions which proceed in the forward direction and go to completion are called  
A. Irreversible reaction B. Equilibrium reaction C. Reversible reaction D. None of the above
24. Given the reaction:  $\text{ZnO} + \text{X} + \text{heat} \rightarrow \text{Zn} + \text{XO}$   
Which element, represented by X, is used industrially to reduce the ZnO to Zn?  
A. Cu B. Pb C. Sn D. C
25. The law which states, "The amount of heat evolved or absorbed in a process is the same whether the process takes place in one or several steps" is  
A. Newton's law B. First law of thermodynamics  
C. Hess's law D. Law of conservation of energy
26. Which type of reaction occurs when a metal undergoes corrosion?  
A. neutralization B. oxidation-reduction C. polymerization D. saponification
27. Which property is generally characteristic of an organic compound?  
A. insoluble in nonpolar solvents B. soluble in polar solvents C. high melting point D. low melting point
28. Which procedure will increase the solubility of KCl in water?  
A. stirring the solute and solvent mixture B. raising the temperature of the solvent C. increasing the surface area of the solute D. increasing the pressure on the surface of the solvent
29. As the temperature of a sample of a radioactive element decreases, the half-life will  
A. Remain the same B. increase C. decrease D. first increase then decrease
30. In common ion effect the degree of ionization is suppressed by the addition of  
A. A compound B. Another electrolyte C. An element D. None
31. Which formula represents a molecular substance?

- A. CO                                      B. CaO                                      C. Li<sub>2</sub>O                                      D. Al<sub>2</sub>O<sub>3</sub>
32. The process in which solvent particles surround solute particles is called,  
 A. Hydration                              B. Hydrolysis                              C. Saturation                              D. Solvation
33. Which sequence of Group 8 of periodic table elements demonstrates a gradual decrease in the strength of the Van der Waals forces? All the choices are elements in the liquid state.  
 A. Ar, Kr, Ne, Xe                              B. Xe, Kr, Ar, Ne                              C. Kr, Xe, Ar, Ne                              D. Ne, Ar, Kr, Xe
34. Given the reaction at equilibrium:  $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g}) + \text{heat}$   
 Which change will shift the equilibrium to the right?  
 A. adding more O<sub>2</sub>                              B. adding a catalyst                              C. decrease the pressure                              D. increasing the temperature
35. What is the oxidation number of carbon in NaHCO<sub>3</sub>?  
 A. +6                                      B. +2                                      C. +4                                      D. -4
36. Reaction of ethanol with iodine gives Iodoform having  
 A. White Ppt.                                      B. Yellow Ppt.  
 C. Pale yellow Ppt.                                      D. Colorless Ppt
37. Esterification of acetic acid in excess ethanol in the presence of sulfuric acid results in  
 A. Carboxylic acid and water                                      B. ethyl acetate and water  
 C. ethyl acetate and carbondioxide                                      D. Ketones and carbondioxide
38. Attachment of an alkyl group in the benzene ring in presence of an alkyl halide and a catalyst AlCl<sub>3</sub> is called  
 A. WurtZ Reaction                                      B. Halogenations  
 C. Friedal-craft's alkylation                                      D. Carbonization
39. Order of reactivity of alkyl halide is  
 A. R-I> R-Br> R-Cl> R-F                                      B. R-Cl> R-I>R-Br>R-F  
 C. R-F> R-CL> R-Br> R-I                                      D. R-Br> R-Cl> R-F> R-I
40. What is a product of oxidative pyrolysis (of CH<sub>4</sub>)?  
 A. CO<sub>2</sub>                                      B. C<sub>6</sub>H<sub>6</sub>  
 C. CH<sub>3</sub>OH                                      D. CO

## SECTION PHYSICS

1. In Newton's rings experiment, the plano-convex lens used should be of,
  - A. Large focal length
  - B. Normal focal length
  - C. Small focal length
  - D. None of the above
2. Two particles of mass 1 kg and 3 kg move towards each other under mutual force of attraction. No other force acts on them. When the relative velocity of approach of the two particles is  $2 \text{ ms}^{-1}$  their centre of mass has a velocity of  $0.5 \text{ ms}^{-1}$  and when the relative velocity of approach become  $3 \text{ ms}^{-1}$ , the velocity of their centre of mass is  $0.75 \text{ ms}^{-1}$ . Then
  - A. The above statement is correct
  - B. The above statement is false
  - C. The velocity changes without the application of an external force.
  - D. Velocity of centre of mass can change in the given case
3. Two converging lenses each of focal length  $f$  are placed in contact. The focal length of the combination is
  - A.  $3f$
  - B.  $f$
  - C.  $2f$
  - D.  $f/2$
4. A man leans over the edge of a cliff and throws a rock upward at  $21.6 \text{ m/s}$ . Neglecting air resistance, two seconds later the rock's speed is
  - A.  $2.4 \text{ ms}^{-1}$
  - B.  $1.4 \text{ ms}^{-1}$
  - C.  $19.6 \text{ ms}^{-1}$
  - D.  $3.6 \text{ ms}^{-1}$
5. A baseball player bats a ball with a force of  $1000 \text{ N}$ . The reaction force that the ball exerts against the bat is
  - A. more than  $1000 \text{ N}$
  - B.  $1000 \text{ N}$
  - C. less than  $1000 \text{ N}$
  - D. impossible to determine
6. A piece of silver and another of germanium are cooled from room temperature to  $80 \text{ K}$ , the resistance of
  - A. Each of them increases
  - B. Each of them decreases
  - C. silver increases and germanium decreases
  - D. silver decreases and germanium increases
7. Which of the following have smaller wave-length.
  - A. radio waves
  - B. x-rays
  - C. Ultra-violet
  - D. infra red

In the radiation spectrum, x- rays lies above radio waves and light.
8. The value of gravitational constant depends upon
  - A. gravitational constant is independent of time, size, temperature, and other physical state of the objects.
  - B. gravitational constant depends the distance between the objects

- C. gravitational constant depends upon the size of the objects  
 D. gravitational constant depends upon the physical configuration of the objects
9. The magnitude of e.m.f. across the secondary of a transformer does not depend upon,
- A. The number of turns in the primary      B. The resistance of the primary and secondary  
 C. The magnitude of the e.m.f. applied across the primary      D. The number of turns in the secondary
10. Electron in hydrogen atom jumps from higher orbit into fourth orbit. The set of line emitted is called,
- A. Paschen series      B. Lyman series      C. Balmer series      D. Bracket series
11. Wave length of radio waves is
- A. Smaller than that of v-ray      B. Smaller than that of ultraviolet ray  
 C. Greater than that of infra-red ray      D. Smaller than that of infra-red ray
12. Maximum details of object can be seen by microscope when light used is of,
- A. White light      B. Short wavelength      C. Large wavelength      D. Any light
13. In order to catch a ball, a baseball player extends the hand forward before impact with the ball and then lets it ride backward in the direction of the ball's motion. Doing this he reduces the force of impact on the player's hand principally because the
- time of relative  
 A. impact is      B. velocity is      C. time of impact is      D. force of impact is  
 increased.      less.      decreased.      reduced.
14. Which of the following phenomenon confirmed the wave nature of electrons?
- A. Compton effect      B. Photoelectric effect  
 C. diffraction of electrons from crystals      D. radioactivity
15. When two tuning forks of nearly the same frequencies are sounded beats produced
- A. Do not travel at all      C. Travel with a velocity less than that of sound  
 B. Travel with a velocity greater than that of sound      D. Travel with the velocity of sound
16. The natural direction of the heat flow between two reservoirs depends upon
- A. Whether they are in solid, liquid state      B. Their pressures

- C. Their temperatures difference                      D. Their heat contents
17. Transverse and longitudinal waves can be distinguished on the basis of  
A. Refraction    B. Polarization    C. Diffraction    D. Interference
18. P-type semi-conductor is obtained by doping germanium crystal with,  
A. Gold                      B. Silver                      C. Boron                      D. Arsenic
19. In photo electric effect, when light of frequency greater than the threshold frequency of the metal falls on the metal surface, the energy of the each emitted electron  
A. is the sum of energy of photon and threshold energy.                      B. is equal to the threshold energy.  
C. is the difference between energy of photon and the threshold energy of the metal.                      D. is unpredictable.
20. Two forces each of magnitude 10 N make angles of  $60^\circ$  and  $120^\circ$  with the axis. The magnitude of Y-component of their resultant is,  
A.  $5\sqrt{3}$                       B.  $20\sqrt{3}$  N                      C. 20 N                      D.  $10\sqrt{3}$  N
21. The ratio of the velocity of sound in hydrogen to the velocity of sound in oxygen is,  
A. 8 : 1                      B. 16 : 1                      C. 4 : 1                      D. 2 : 1
22. The electron emission take place through a hot metal surface at a relatively low temperature if the metal surface  
A. Has large area    B. is heated Continuously    C. is coated with Oxide    D. Has low work function
23. A job is done slowly, while an identical job is done quickly. Both jobs require the same amount of work, but different amounts of  
A. effort                      B. power                      C. energy                      D. None
24. In forward biasing of a P-N junction the barrier potential of the junction,  
A. Decreases    B. Remains same    C. Increases    D. fluctuate
25. On the surface of Jupiter, where the acceleration due to gravity is about three times that of Earth, a 100-kg rock would have a mass of about  
A. 300 Kg                      B. 600 Kg                      C. 50 Kg                      D. 100 Kg
26. The air between the lens and the plate in Newton's ring experiment is replaced by water. The ring pattern  
A. Remains the same    B. Expands                      C. Contracts                      D. None of the above

27. A simple arrangement by means of which emf are compared is known  
 A. Ohm meter      B. Potentiometer      C. Ammeter      D. Potential divider
28. A body of mass  $m$ , placed on an inclined surface making an angle  $\theta$  with the ground, moves down. The component that balances the reaction force of the surface is  
 A.  $mg\sin\theta$       B.  $mg\cos\theta$       C.  $mg\tan\theta$       D. None
29. Two particles having mass  $M$  and  $m$  are moving in a circle of radius  $R$  and  $r$ . If their time periods are same then the ratio of angular velocity will be  
 A.  $r/R$       B.  $\sqrt{\frac{R}{r}}$   
 C.  $R/r$       D. 1
30. A 110 Watt bulbs operates on 220V supply. The current flowing through the bulb is  
 A. 1 A      B. 2 A  
 C. 0.5 A      D. 0.25 A
31. Where does a body weigh maximum?  
 A. at moon      B. at Jupiter  
 C. at the center of the earth      D. on the surface of the earth
32. A particle starts with initial velocity  $10\text{ ms}^{-1}$ . It covers a distance of 20 m along a straight line with the same velocity, in two seconds. What is acceleration of the particle?  
 A.  $20\text{ ms}^{-2}$       B.  $10\text{ ms}^{-2}$   
 C.  $1\text{ ms}^{-2}$       D. Zero
33. The force that prevents the relative motion between the layers of a liquid is called  
 A. Static friction      B. Normal reaction  
 C. Contact friction      D. viscosity
34. If the period of oscillation of mass  $M$  suspended from a spring is 2 seconds, then the period of mass  $4M$  will be  
 A. 1 s      B. 4 s  
 C. 2 s      D. 3 s
35. A wire of resistance is 1 ohm is stretched to double its length. The resistance will become  
 A. 1 ohm      B. 4 ohms  
 C. 2 ohms      D. 8 ohms



36. When a woman stands at rest with two feet on a scale, the scale reads 500 N. When she gently lifts one foot, the scale reads
- less than 500 N.
  - more than 500 N.
  - 500 N.
- 250 N
  - 400 N
  - 600 N
  - 500 N
37. Which of the following quantities remains constant in step down 100% efficient transformer?
- Voltage
  - Current
  - Power
  - Heat
38. Which of the following can be zero when the particle is in motion for some time?
- Speed
  - Displacement
  - Distance covered
  - none of these
39. A transformer has  $\frac{N_2}{N_1} = 10$ , the load current is 10 A the current in primary is
- 10 A
  - 1 A
  - 200 A
  - 100 A
40. The speed of light in vacuum is  $3 \times 10^8$  ms<sup>-1</sup>. Its speed in a medium of refractive index 2 will be
- $6.5 \times 10^8$
  - $1.5 \times 10^8$  ms<sup>-1</sup>
  - $4.5 \times 10^8$  cm
  - $5.5 \times 10^8$

### Section Math

1.  $\lim_{x \rightarrow 0} \frac{\sin x \cdot mx}{\tan x \cdot nx} = ?$
- $\frac{n}{m}$
  - $\frac{m}{n}$
  - mn

- D.  $(m)^n$
2. The derivative of  $6x^3 + 10x + 6x^3$  is
- A.  $8x^2$   
 B.  $6x^2$   
 C. 1  
 D. 6
3. If the sum of roots of the equation  $x^2 + Px + q = 0$  is three times the difference of the roots then
- A.  $1p^2 = 2q$   
 B.  $2q^2 = 9p$   
 C.  $2p^2 = 9q$   
 D.  $9q^2 = 2p$
4.  $\frac{501}{2} + \frac{502}{2} + \frac{503}{2} + \frac{504}{2} + \dots = ?$
- A. 1  
 B. -1  
 C. 0  
 D. -2
5. The 9<sup>th</sup> term of the series  $27 + 9 + 5 + \frac{5}{2} + \dots$  is
- A.  $1\frac{10}{7}$   
 B.  $\frac{10}{17}$   
 C.  $\frac{16}{27}$   
 D.  $\frac{17}{27}$

6.  $\sum_{K=1}^n K^3 = ?$
- A.  $\frac{K(K+1)}{2}$
- B.  $\frac{k^2(k+1)^2}{4}$
- C.  $\frac{[n(n+1)]^2}{4}$
- D.  $\frac{n(n+1)}{2}$
7.  $\frac{\cos 12 + \sin 12}{\cos 12 - \sin 12} = ?$
- A. Tan 42
- B. Tan 52
- C. Tan 57
- D. Tan 33
8.  $\begin{vmatrix} 1 & 2 & 1 \\ 2 & x & 2 \\ 3 & 6 & x \end{vmatrix} = 0$  then  $x = ?$
- A. 3
- B. 4
- C. None
- D. Both a and b
9. A force  $F = 3i + 2j - 4k$  is acting at a point  $(1, -1, 2)$  then its moment through the Pt  $(2, -1, 3)$  is
- A.  $2i - 7j - 2k$
- B.  $3i + 4j - 5k$
- C.  $2j$
- D.  $2k$

10.  $\int \frac{\sqrt{\tan x}}{\sin x \cos x} dx = ?$

A.  $2\sqrt{\sec x + c}$

B.  $2\sqrt{\tan x + c}$

C.  $\frac{2}{\sqrt{\tan x}} + c$

D.  $\frac{2}{\sqrt{\sec x}} + c$

11. Which of the following does not represent hyperbola?

A.  $xy = 1$

B.  $x^2 - y^2 = 5$

C.  $(x-1)(y-1) = 3$

D.  $x^2 - y^2 = 0$

12. The period of  $\tan 3Q = ?$

A.  $2\pi$

B.  $\frac{2\pi}{3}$

C.  $\frac{\pi}{3}$

D.  $\pi$

13. Which of the following is not true

A.  $\sin x = -1/5$

B.  $\cos x = 1$

C.  $\sec x = 1/2$

D.  $\tan 20$

14.  $\cos 105 + \sin 105 = ?$

A.  $\frac{1}{2}$

- B. 1
- C.  $\sqrt{2}$
- D.  $\frac{1}{\sqrt{2}}$

15. the value of  $\frac{A-13}{B-A}$  will be

- A.  $>0$
- B.  $<0$
- C.  $=0$
- D. A

16. What is slope of tangent to the curve  $y = e^{2x^2}$  at  $x = 0$

- A. 0
- B. 1
- C.  $\frac{1}{2}$
- D. 4

17.  $\cos^{-1} \frac{1}{2} + \sin^{-1} \left(\frac{1}{2}\right) = ?$

- A.  $\frac{\pi}{4}$
- B.  $\frac{\pi}{6}$
- C.  $\frac{\pi}{3}$
- D.  $\frac{2\pi}{3}$

18. If  $\Delta ABC$  if  $w = 16$ ,  $b = 24$   $c = 20$ ,  $\cos \frac{1}{2} = ?$

- A.  $\frac{3}{4}$
- B.  $\frac{11}{4}$
- C.  $\frac{1}{2}$

D.  $\frac{1}{3}$

19.  $\frac{d}{dx} (\sin^{-1}(3x - 4x^3)) = ?$

A.  $\frac{3}{\sqrt{1-x^2}}$

B.  $\frac{-3}{\sqrt{1-x^2}}$

C.  $\frac{1}{\sqrt{1-x^2}}$

D.  $\frac{-1}{\sqrt{1-x^2}}$

20. The eccentricity of the hyperbola which passes through the point  $(3, 0)$ ,  $(3, \sqrt{2}, 2)$  is

A.  $\frac{13}{3}$

B.  $\frac{\sqrt{13}}{3}$

C.  $\sqrt{\frac{13}{3}}$

D.  $\frac{13}{\sqrt{3}}$

21.  $(\cos Q + i \sin Q)^2, (\cos 2Q + i \sin 2Q)^5$

A.  $(\cos 2Q + i \sin 2Q)^6$

B.  $(\cos 10Q + i \sin 10Q)^6$

C.  $\cos 7Q + i \sin 7Q$

D. None

22. The 9<sup>th</sup> term of the series

$127 + 9 + 5 + \frac{5}{2} + \dots$  is

A.  $1 \frac{10}{17}$

- B.  $\frac{10}{17}$
- C.  $\frac{16}{27}$
- D.  $\frac{17}{27}$

23. Three dice are rolled simultaneously and then find the probability that the sum is greater than four are

- A.  $\frac{3}{216}$
- B.  $\frac{52}{53}$
- C.  $\frac{53}{54}$
- D.  $\frac{13}{216}$

24. The area b/w  $y = 4\sin x$  from to  $\pi$  is

- A. 1
- B. 2
- C. 4
- D. 8

25. If  $\left|\frac{a}{b}\right| = 2$ ,  $\frac{a}{b} = 5$ ,  $\frac{a}{a'} \times \frac{b}{b'} = 8$  then  $\frac{a'}{a} \cdot \frac{b'}{b} = ?$

- A. 16
- B. 20
- C. -16
- D. 6

26. Which of the following is not value of  $2\tan^{-1}x = ?$

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

- B.  $\text{Cos}^{-1} \left( \frac{1-x^2}{1+x^2} \right)$
- C.  $\text{Tan}^{-1} \left( \frac{2x}{1+x^2} \right)$
- D.  $\text{Tan}^{-1} \left( \frac{2x}{1-x^2} \right)$

27. One root of the equation

$$2^{x^2} - 10, 2^x + 16 = 0 \text{ is}$$

- A. 1
- B. 0
- C. -1
- D. 2

28. For  $y = x \text{ e}^x$  the point

- A.  $x = -1$  minimum
- B.  $x = -1$  is a maximum
- C.  $x = 0$  is a minimum
- D.  $x = 0$  is max

29.  $\frac{d}{dx} (\log_a x) = ?$

- A.  $a^x \ln a$
- B.  $\frac{1}{x \ln a}$
- C.  $1/x$
- D.  $\frac{1}{x \ln 10}$

30. If  $f(x) = 3x^2 - 1$  then  $\lim_{x \rightarrow 1} \frac{f(x) - f(1)}{x - 1} = ?$

- A.  $6x$
- B. 6



- C. -1
- D. -6

31. The fifth term of the sequence  $a_n = 2n - 3$  is \_\_\_\_\_ .

- A) 13
- B) -13
- C) 7
- D) -7

32. The harmonic mean between a and b is

- A)  $\frac{a+b}{2}$
- B)  $\pm\sqrt{ab}$
- C)  $\frac{a-b}{2}$
- D)  $\frac{2ab}{a+b}$

33.  $\frac{8!}{6!} = \underline{\hspace{2cm}}$  .

- A) 8
- B)  $\frac{1}{56}$
- C) 56
- D) None of these

34.  ${}^{16}C_{11} + {}^{16}C_{10} = \underline{\hspace{2cm}}$  .

- A)  ${}^{16}C_{10}$
- B)  ${}^{15}C_{11}$
- C)  ${}^{17}C_{10}$
- D)  ${}^{17}C_{11}$

35. In the expansion of  $(a+x)^n$  the sum of exponents of a and x in each term of the expansion is

- A)  $n+1$
- B)  $n-1$
- C)  $n$
- D)  $2n$

36. The number of terms in the expansion of  $\left[x^2 - \frac{4}{x^2}\right]^9$  is

- A) 8
- B) 9

C) 10

D) 11

37.  $\cos^2 \frac{\theta}{2} + \sin^2 \frac{\theta}{2} = \underline{\hspace{2cm}}$ .

A) 2

B)  $\frac{1}{2}$

C) 1

D) None of these

38. The area of a sector of a circular region of radius  $r$  and central angle  $\theta$  radian is

A)  $r^2\theta$

B)  $\frac{1}{2}r^2\theta$

C)  $r\theta$

D)  $\frac{1}{2}r^2\theta$

39.  $\cos(2\pi + \theta) = \underline{\hspace{2cm}}$ .

A)  $\sin \theta$

B)  $\cos \theta$

C)  $-\sin \theta$

D)  $-\cos \theta$

40.  $2 \sin a \cos \beta = \underline{\hspace{2cm}}$ .

A)  $\cos(a + \beta) - \cos(a - \beta)$

B)  $\cos(a + \beta) + \cos(a - \beta)$

C)  $\sin(a + \beta) - \sin(a - \beta)$

D)  $\sin(a + \beta) + \sin(a - \beta)$

# OR

## Section Biology

1. A largest community primarily determined by climate is a
 

A) Ecosystem	B) Biodiversity
C) Biome	D) Diversity
  
2. The molecules with high molecular weight such as starch and proteins are
 

A) Micromolecules	B) Macromolecules
C) Organic molecules	D) Inorganic molecules
  
3. If a theory is continuously supported by experimental evidence it becomes a
 

A) Law	B) Theory
C) Hypotheses	D) Scientific law
  
4. The most abundant compound in all organisms is
 

A) Protein	B) Carbohydrate
C) Water	D) Lipid
  
5. The compound that has two amino acid sub- units is called
 

A) Polypeptide	B) Peptide
C) Dipeptide	D) None of these
  
6. The poisons, antibodies and anti-metabolites are examples of
 

A) Coenzymes	B) Prosthetic groups
C) Activators	D) Inhibitors
  
7. The soluble part of the cytoplasm is called
 

A) Cytosol	B) Suspension
C) Collide	D) True solution
  
8. The flattened vesicles in chloroplasts that arrange themselves to form Grana and intergrana are called
 

A) Thylakoids	B) Grana
C) Stroma	D) Cisternae
  
9. The assembly and disassembly of the spindle structure during mitosis is the role of
 

A) Microtubules	B) Microfilaments
C) Intermediate filaments	D) All these
  
10. Which of the following is considered self – replicating organelle?

- A) Ribosomes  
B) Lysosomes  
C) Mitochondria  
D) Leucoplasts
- 11 A Bacteriophages reproduces by using the metabolic machinery of bacteria cell, i, e chromosomes and  
A) Mitochondria  
B) Cell membrane  
C) Ribosomes  
D) Golgi bodies
- 12 Cell wall is absent in one of the following bacteria.  
A) Escherichia coli  
B) Mycoplasma  
C) Pseudomonas  
D) Spirochete
- 13 Bacteria lack  
A) Mitosis  
B) Cell division  
C) Traditional sexual reproduction  
D) All these
- 14 Trypanosoma is transmitted by the bite of infected  
A) House fly  
B) Mosquito  
C) Tsetse fly  
D) All these
- 15 Fungal hyphae that are in the form of an elongated multinucleate large cell are called  
A) Septate  
B) Aseptate  
C) Coenocytic  
D) Multinucleate
- 16 An ascus is to ascomycetes as is a to basidiomycetes  
A) Basidiospore  
B) Basidicarp  
C) Basidium  
D) Haustorium
- 17 The loose smut of wheat is caused by  
A) Puccinia  
B) Ustilago  
C) Fusarium  
D) Morchella
- 18 A small outgrowth present on the upper side of leaves of leaves of sporophylls near the base in selaginella is  
A) Ligule  
B) Prophyll  
C) Microphyll  
D) Megaphyll
- 19 When the frond is immature and young it is coiled. This pattern of development is called circinate  
A) Venation  
B) Vernation  
C) Phyllotaxis  
D) Aestivation

- 20 Double fertilization is characteristics of which of the following
- A) Thallophytes  
 B) Embryophytes  
 C) Spermatophytes  
 D) Angiosperms
- 21 A gelatinous layer present between the body wall layers of the sponges is
- A) Mesenchyme  
 B) Mesoderm  
 C) Mesoglea  
 D) Mesenchyma
- 22 Which of the following is host for liver fluke?
- A) Snail  
 B) Sheep  
 C) Man  
 D) All these
- 23 A group of ancient fish that modified their breathing system and developed lungs to adapt to terrestrial mode of life is
- A) Pisces  
 B) Dipnoi  
 C) Varanope  
 D) Cotylsaurs
24. The group of mammal that form connecting link between reptiles an mammals is
- A) Prototheria  
 B) Metatheria  
 C) Eutheria  
 D) None
- 25 Which of the following chlorophylls is most abundant and takes part directly, in the light reaction of photosynthesis?
- A) Chlorophylls a  
 B) Chlorophylls b  
 C) Chlorophylls c  
 D) Bacteriochlorophyll
- 26 The process that uses membranes to couple redox reactions to ATP production is known as
- A) Photosystem  
 B) Z – Scheme  
 C) Chemosmosis  
 D) Glycolysis
- 27 The products of light reactions ATP and NADPH are used in which of the following phases of Calvin cycle.
- A) Carbon fixation  
 B) Reduction  
 C) Regeneration of RuBP  
 D) All these
- 28 Digestive system in man is associated with which of the following glands.
- A) Salivary glands  
 B) Liver  
 C) Pancreas  
 D) All these
- 29 A blind sac that project from the large intestine between ileum and colon is
- A) Caecum  
 B) Jejunum  
 C) Rectum  
 D) Appendix

- 30 The glycoate produced during photorespiration enters
- A) Mitochondria  
B) Ribosomes  
C) Peroxisomes  
D) Glyoxysomes
- 31 The pulmonary disorder associated with breakdown of alveoli is referred to as
- A) Cancer  
B) Tuberculosis  
C) Asthma  
D) Emphysema
- 32 One of the following is considered to act as multisensory hydraulic valves and respond to environment stimuli.
- A) Stomata  
B) Guard cells  
C) Lenticels  
D) Hydathodes
- 33 In embryonic life blood cells are formed in the
- A) Bone marrow  
B) Liver  
C) Spleen  
D) Liver and spleen
- 34 One of the following phenomenon is responsible for the loss of liquid water through water secreting glands or Hydathodes
- A) Bleeding  
B) Gutlation  
C) Transportation  
D) Imbibition
- 35 Which of the following type of cells are produced by the spleen thymus tonsils and adenoids
- A) Platelets  
B) Agraulocytes  
C) Erythrocytes  
D) Lymphocytes
- 36 The elimination of wasteful metabolites, mainly of the nitrogenous nature is called
- A) Osmoregulation  
B) Excretion  
C) Pyrexia  
D) Regulation strategies
- 37 The excretory structures in animal kingdom that are associated with digestive tract are
- A) Nephridia  
B) Malpighian tubules  
C) Flame cells  
D) Nephrons
- 38 Bats use one of the following for evaporative cooling in warm temperatures
- A) Sweet  
B) Saliva  
C) Urine  
D) Saliva and urine
- 39 Nutation is because of
- A) Growth on opposite side of contact  
B) Alternate changes in growth

- C) Loss of turgor in the cells of pulvinus
- 40 Epinasty is because of
- A) Auxins
- B) Gibberellins
- C) Abscissic acid
- D) Ethylene
- D) Movement of K ions from the cells of pulvinus

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