

ULTIMATE TEST SERIES NEET 2020

(XII) TEST-01

PATTERN : NEET

- Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.
- You are not allowed to leave the Examination Hall before the end of the test.

Name :

M.M.: 720

Time : 3 hrs

BRANCH : DEHRADUN, KOTDWAR, HALDWANI, AGRA, SAHARANPUR Test Date : 17-03-2020

TOPIC :

Physics : Physical World, Units & Measurements, Motion in a straight line

Chemistry : Some Basic Concepts of Chemistry, Structure of Atom

Biology : The Living World, Biological Classification, Animal Kingdom
(General Account and Non chordata)

INSTRUCTIONS :

- Attempt **All** the questions. This Test booklet consists of **180** questions. The maximum marks are 720
- There are three parts in the question paper of **Physics, Chemistry** and **Biology (Botony, Zoology)** having **45** questions .
- Each question is allotted **4 (four)** marks for each correct response
- There is **1/4th** negative marking for each wrong attempt The total duration of the test is **3 hrs**.
- There is no negative marking for un-attempted questions.
- Use Blue/black ball point pen to fill the **OMR**
- Write your **Name** and **Roll number** carefully on the **OMR** sheet as well as the question paper.



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PHYSICS

1. Find minimum value of $y = 5x^2 - 2x + 1$ is
 (1) $\frac{4}{5}$ (2) $\frac{3}{5}$ (3) $\frac{1}{5}$ (4) $\frac{2}{5}$
2. From the top of a tower, a particle is thrown vertically downwards with a velocity of 10 m/s. The ratio of the distances, covered by it in the 3rd and 2nd seconds of the motion is (Take $g = 10 \text{ m/s}^2$)
 (1) 5 : 7 (2) 7 : 5 (3) 3 : 6 (4) 6 : 3
3. The radius of a circular plate increases at the rate of 0.1 cm/sec. At what rate does the area increase when the radius of plate is $\frac{5}{11}$ cm.
 (1) 1 cm²/sec (2) 0.1 cm²/sec
 (3) 0.6 cm²/sec (4) 0.29 cm²/sec
4. If $L = 2.331 \text{ cm}$, $B = 2.1 \text{ cm}$, then $L + B =$
 (1) 4.431 cm (2) 4.43 cm
 (3) 4.4 cm (4) 4 cm
5. The position of a particle moving in the xy-plane at any time t is given by $x = (3t^2 - 6t)$ metres, $y = (t^2 - 2t)$ metres. Select the correct statement about the moving particle from the following :-
 (1) The acceleration of the particle is zero at $t = 0$ second
 (2) The velocity of the particle is zero at $t = 0$ second
 (3) The velocity of the particle is zero at $t = 1$ second
 (4) The velocity and acceleration of the particle are never zero
6. Which one of the following quantities has dimensions different from the remaining three
 (1) Energy per unit volume
 (2) Force per unit area
 (3) Product of voltage and charge per unit volume
 (4) Angular momentum per unit mass
7. A body starts from rest and travels a distance S with uniform acceleration, then moves uniformly a distance $2S$ and finally comes to rest after moving further $3S$ under uniform retardation. The ratio of the average velocity to maximum velocity is :-
 (1) $2/5$ (2) $3/5$
 (3) $4/7$ (4) $5/7$
8. From the v-t graph, the:

 (1) speed at $t = 1 \text{ s}$ is 1.2 m/s
 (2) acceleration is 2 m/s^2
 (3) average speed during 1st second is 1.5 m/s
 (4) speed of the particle can be zero
9. If the sum of two unit vectors is a unit vector, then the magnitude of their difference is :-
 (1) $\sqrt{2}$ (2) $\sqrt{3}$ (3) $1/\sqrt{2}$ (4) $\sqrt{5}$
10. The component of vector $\vec{A} = 2\hat{i} + 3\hat{j}$ along the vector $\hat{i} + \hat{j}$ is :-
 (1) $\frac{5}{\sqrt{2}}$ (2) $10\sqrt{2}$ (3) $5\sqrt{2}$ (4) 5
11. Two forces, each of magnitude F have a resultant of the same magnitude F . The angle between the two forces is :-
 (1) 45° (2) 120°
 (3) 150° (4) 60°
12. A 150 m long train is moving with a uniform velocity of 45 km/h. The time taken by the train to cross a bridge of length 850 meters is
 (1) 56 sec (2) 68 sec
 (3) 80 sec (4) 92 sec
13. A particle moves with uniform acceleration and v_1, v_2 and v_3 denote the average velocities in the three successive intervals of time t_1, t_2 and t_3 . Which of the relations given below is correct ?
 (1) $(v_1 - v_2) : (v_2 - v_3) = (t_1 - t_2) : (t_2 + t_3)$
 (2) $(v_1 - v_2) : (v_2 - v_3) = (t_1 + t_2) : (t_2 + t_3)$
 (3) $(v_1 - v_2) : (v_2 - v_3) = (t_1 - t_2) : (t_1 - t_3)$
 (4) $(v_1 - v_2) : (v_2 - v_3) = (t_1 - t_2) : (t_2 - t_3)$
14. The mean time period of second's pendulum is 2.00s and mean absolute error in the time period is 0.05s. To express maximum estimate of error, the time period should be written as :
 (1) $(2.00 \pm 0.01)\text{s}$
 (2) $(2.00 \pm 0.025)\text{s}$
 (3) $(2.00 \pm 0.05)\text{s}$
 (4) $(2.00 \pm 0.10)\text{s}$

15. If \vec{A} is perpendicular to \vec{B} then :-

- (1) $\vec{A} \times \vec{B} = \vec{0}$
 (2) $\vec{A} \cdot (\vec{A} + \vec{B}) = A^2$
 (3) $\vec{A} \cdot \vec{B} = AB$
 (4) $\vec{A} \cdot (\vec{A} + \vec{B}) = A^2 + AB$

16. Mark the correct statement :-

- (1) $|\vec{a} + \vec{b}| \geq |\vec{a}| + |\vec{b}|$ (2) $|\vec{a} + \vec{b}| \leq |\vec{a}| + |\vec{b}|$
 (3) $|\vec{a} - \vec{b}| \geq |\vec{a}| + |\vec{b}|$ (4) All of the above

17. Using Mass (M), Length (L), Time (T) and electric current (A) as fundamental quantities, the dimensions of permittivity will be :-

- (1) $MLT^{-1} A^{-1}$ (2) $MLT^{-2} A^{-2}$
 (3) $M^{-1}L^{-3}T^4 A^2$ (4) $M^2L^{-2}T^{-2}A$

18. For motion of an object along x-axis, the velocity v depends on the displacement x as $v = 3x^2 - 2x$. What is the acceleration at $x = 2$

- (1) 48 m/s² (2) 80 m/s²
 (3) 18 m/s² (4) 10 m/s²

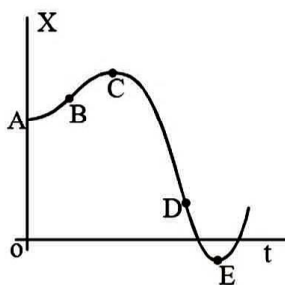
19. The quantities A and B are related by the relation, $m = A/B$, where m is the linear density and A is the force. The dimensions of B are of:-

- (1) Pressure (2) Work
 (3) Latent heat (4) None of the above

20. One kilowatt hour is a unit of :-

- (1) Energy (2) Power
 (3) Electric charge (4) Electric current

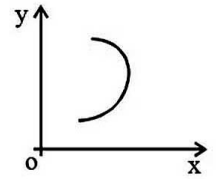
21. For the position (x) - time (t) graph shown of particle in one dimensional motion. Choose the incorrect alternatives from below :-



- (1) Particle was released from rest at $t = 0$
 (2) At C particle will reverse its direction of motion.
 (3) Average velocity for motion between B and D is positive
 (4) At E, velocity = 0 and acceleration > 0

22. If the given graph is possible in realistic situations, then y and x variables may represent respectively :-

- (1) acceleration and time
 (2) velocity and time
 (3) velocity and displacement
 (4) displacement and time



23. A student measures the distance traversed in free fall of a body, initially at rest in a given time. He uses this data to estimate g , the acceleration due to gravity. If the maximum percentage errors in measurement of the distance and the time are e_1 and e_2 respectively, the percentage error in the estimation of g is :-

- (1) $e_1 + 2e_2$ (2) $e_1 + e_2$
 (3) $e_1 - 2e_2$ (4) $e_2 - e_1$

24. The velocity v of a particle at time t is given

by $v = at + \frac{b}{t+c}$, where a , b and c are constants.

The dimensions of a , b and c are respectively:-

- (1) LT^{-2} , L and T (2) L^2 , T and LT^2
 (3) LT^2 , LT and L (4) L, LT and T^2

25. If a ball is thrown vertically upwards with speed u , the distance covered during the last 't' seconds of its ascent is :-

- (1) ut (2) $\frac{1}{2}gt^2$

- (3) $ut - \frac{1}{2}gt^2$ (4) $(u + gt)t$

26. The vector sum of two forces is perpendicular to their vector differences. In that case, the forces :-

- (1) Are equal to each other.
 (2) Are equal to each other in magnitude.
 (3) Are not equal to each other in magnitude.
 (4) Cannot be predicted.

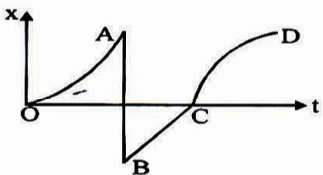
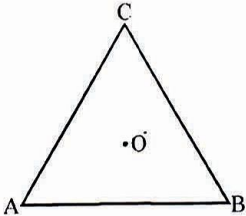
27. If $(\vec{A} = 2\hat{i} - 3\hat{j} + 7\hat{k})$, $\vec{B} = \hat{i} + 2\hat{k}$ and $\vec{C} = \hat{j} - \hat{k}$,

find $\vec{A} \cdot (\vec{B} \times \vec{C})$:-

- (1) $-2\hat{i} + \hat{j} + \hat{k}$ (2) 0
 (3) $\hat{i} + 2\hat{k}$ (4) None

28. A body moves with velocity v , $2v$ and $3v$ in the first, second and third, one third distance of path travelled. Its average speed is :-
- (1) $\left(\frac{6}{11}\right)v$ (2) $\left(\frac{12}{11}\right)v$
- (3) $\left(\frac{18}{11}\right)v$ (4) $\left(\frac{36}{11}\right)v$
29. Two cars A and B are travelling in the same direction with velocities v_1 and v_2 ($v_1 > v_2$). When the car A is at a distance d behind of the car B, the driver of the car A applied the brake producing a uniform retardation a . There will be no collision when
- (1) $d < \frac{(V_1 - V_2)^2}{2a}$ (2) $d < \frac{V_1^2 - V_2^2}{2a}$
- (3) $d > \frac{(v_1 - v_2)^2}{2a}$ (4) $d > \frac{V_1^2 - V_2^2}{2a}$
30. If the units of force, energy and velocity in a new system be 10 N, 5 J and 5 m/s respectively, then the unit of distance in this system is :-
- (1) 0.25 m (2) 0.5 m
- (3) 1 m (4) 2 m
31. Vector \vec{a} is perpendicular to \vec{b} . Component of $(\vec{a} - \vec{b})$ along $(\vec{a} + \vec{b})$ will be -
- (1) Zero (2) $a - b$
- (3) $\frac{a^2 - b^2}{\sqrt{a^2 + b^2}}$ (4) $\sqrt{a^2 + b^2}$
32. Two persons A and B running on a track in the same direction observe a car. A says that the car is moving in east direction and B says that the car is moving in north direction. They contradict the direction but say that magnitude is same. If the speed of B is double that of the speed of A, then the true direction of the car will be :-
- (1) $\theta = \tan^{-1}\left(\frac{1}{2}\right)$ North of East
- (2) $\theta = \tan^{-1}\left(\frac{1}{2}\right)$ South of East
- (3) $\theta = \tan^{-1}\left(\frac{1}{3}\right)$ North of East
- (4) None of these
33. The position of a particle moving along X-axis depends on time according to equation $x = at^2 + bt^3$, where x is in meter and t in seconds. What are the dimensions of a and b ?
- (1) LT^{-1} , L (2) LT^{-2} , LT^{-3}
- (3) L, L^2 (4) T^2 , T^3
34. A physical quantity P is related to four observables a , b , c and d as follows : $P = \frac{a^3 b^2}{\sqrt{c} d}$. The percentage errors of measurement in a , b , c and d are 1%, 3%, 4% and 2% respectively. What is the percentage error in the quantity P ?
- (1) 8% (2) 13%
- (3) 12% (4) 2%
35. The initial and final temperature of water as recorded by an observer are $(40.6 \pm 0.2)^\circ\text{C}$ and $(78.3 \pm 0.3)^\circ\text{C}$. Calculate the rise in temperature with proper error limits.
- (1) $(37.7 \pm 0.5)^\circ\text{C}$ (2) $(37.7 \pm 0.1)^\circ\text{C}$
- (3) $(118.9 \pm 0.5)^\circ\text{C}$ (4) 28°C
36. According to dimensional analysis, which is the incorrect statement ?
- (1) Gravitational force + Electric force
- (2) Acceleration due to gravity + acceleration due to electric force
- (3) Gravitational field intensity + Electric field intensity
- (4) Gravitational field intensity \times Electric field intensity
37. The ratio of surface tension to viscosity coefficient can be represented by the dimensions of :-
- (1) Acceleration (2) Angular velocity
- (3) Impulse (4) Velocity
38. An electron starting from rest, has a velocity v that increases linearly with time t so that $v = kt$, where $k = 2\text{m/s}^2$. Find the distance covered by it in the first three seconds.
- (1) 18 m (2) 9 m
- (3) 6m (4) 4 m
39. Find the angle between the vectors $(\hat{i} + 2\hat{j} + 3\hat{k})$ and $(2\hat{i} - \hat{j})$:-
- (1) 0° (2) 120°
- (3) 90° (4) 60°

CHEMISTRY

40. One of the rectangular components of velocity of 80 km/hr is 40 km/hr. The value of other component (approx) :-
 (1) 40 km/hr (2) 20 km/hr
 (3) 70 km/hr (4) 30 km/hr
41. The component of a vector \vec{r} along x-axis will have maximum value if :-
 (1) \vec{r} , is along +y-axis
 (2) \vec{r} , is along +x-axis
 (3) \vec{r} makes angle angle of 45° with x-axis
 (4) \vec{r} , is along -x axis
42. The displacement-time graph of a body is shown in figure. The body is accelerated along the path :-

 (1) OA only (2) BC only
 (3) CD only (4) OA and CD both
43. Which of the following is not measured in the units of energy ?
 (1) Force couple \times angle of rotation
 (2) Moment of inertia \times (angular velocity)²
 (3) Force \times distance
 (4) Impulse \times time
44. ABC is an equilateral triangle of centre O :-
 The value of $\overline{AB} + \overline{AC} = \dots\dots\dots$
 (1) $2\overline{AO}$
 (2) $3\overline{OA}$
 (3) $3\overline{AO}$
 (4) $4\overline{AO}$

45. Which of the following statement is correct :-
 (1) A dimensionally correct equation may be physical incorrect.
 (2) A dimensionless quantity may have units.
 (3) Dimensions of a base quantity in other base quantities is always zero.
 (4) All of the above.
46. The momentum of a photon with energy 20 eV is
 (1) $10.0 \times 10^{-27} \frac{\text{kg} \times \text{m}}{\text{s}}$
 (2) $10.95 \times 10^{-27} \frac{\text{kg} \times \text{m}}{\text{s}}$
 (3) $10.66 \times 10^{-27} \frac{\text{kg} \times \text{m}}{\text{s}}$
 (4) $10.2 \times 10^{-27} \frac{\text{kg} \times \text{m}}{\text{s}}$
47. Wave number of a spectral line for a given transition is $y\text{cm}^{-1}$ for He^+ , then its value for Li^{2+} for the same transition is
 (1) $4y\text{cm}^{-1}$ (2) $y\text{cm}^{-1}$
 (3) $\frac{3y}{4}\text{cm}^{-1}$ (4) $\frac{9y}{4}\text{cm}^{-1}$
48. Arrange the orbitals of H-atom in the increasing order of their energy
 $3p_x, 2s, 4d_{xy}, 3s, 4p_z, 3p_y, 4s$
 (1) $2s < 3s < 3p_x = 3p_y < 4s < 4p_z < 4d_{xy}$
 (2) $2s < 3s = 3p_x = 3p_y < 4s = 4p_z = 4d_{xy}$
 (3) $2s < 3s < 3p_x = 3p_y < 4s = 4p_z = 4d_{xy}$
 (4) $2s < 3p_x = 3p_y < 3s < 4s = 4p_z < 4d_{xy}$
49. The number of gram atoms of oxygen present in 0.3 gram mole of $(\text{COOH})_2 \cdot 2\text{H}_2\text{O}$ is:
 (1) 0.6 (2) 1.8 (3) 1.2 (4) 3.6
50. If the total energy of an electron in a hydrogen atom in excited state is -3.4 eV, then the de-Broglie wavelength of the electron is
 (1) 3.3×10^{-8} cm (2) 6.6×10^{-10} cm
 (3) 3.3×10^{-10} cm (4) 6.64×10^{-8} cm
51. An enzyme peroxidase has 5% by weight of sulphur (S = 32) its minimum molecular weight will be-
 (1) 320 (2) 640 (3) 1280 (4) 480
52. If 'X' is ionization energy of hydrogen then the energy required for excitation of Li^{2+} electron from 2nd excited state to 5th excited state is-
 (1) $\frac{3X}{4}$ (2) $\frac{4}{3X}$ (3) $\frac{X}{12}$ (4) $\frac{12}{X}$

53. 100 ml of PH_3 when completely decomposed produces phosphorus and hydrogen. The change in volume of the gas is -
 $\text{PH}_3(\text{g}) \longrightarrow \text{P}(\text{s}) + \frac{3}{2}\text{H}_2(\text{g})$
 (1) 50 ml increase (2) 500 ml decrease
 (3) 900 ml decrease (4) nil
54. The number of waves made by any electron moving in an orbit having maximum magnetic quantum number (m_l) = +3 is -
 (1) 3 (2) 4 (3) 5 (4) 6
55. If the velocity of an electron in 1st orbit of H atom is V, then what will be the velocity in 4th orbit of Be^{+3} :-
 (1) V (2) $\frac{V}{4}$ (3) 16 V (4) 4 V
56. The empirical formula of a compound is CH. Its molecular weight is 78. The molecular formula of the compound will be :
 (1) C_2H_2 (2) C_3H_3 (3) C_4H_4 (4) C_6H_6
57. 100 mL of a mixture of NaOH and Na_2SO_4 is neutralised by 10 mL of 0.5 M H_2SO_4 . Hence NaOH in 100 mL solution is:
 (1) 0.2 g (2) 0.4 g
 (3) 0.6 g (4) None of these
58. Which of the following has the highest mass :-
 (1) 1 g-atom of phosphorous
 (2) 2 moles of water
 (3) 22.4 L of CO_2 gas at NTP
 (4) 6.02×10^{23} atoms of sulphur
59. Mole fraction of O_2 in O_2 and O_3 mixture is 0.25. Hence percentage concentration $\left(\frac{w}{W}\%\right)$ of O_2 in mixture is :-
 (1) 18.18 (2) 1.81 (3) 81.82 (4) 8.18
60. When 17g of H_2A (dibasic acid) completely neutralised with 100 mL, 1M BOH(monoacidic base) then molecular weight of acid is :-
 (1) 170 (2) 340
 (3) 85 (4) None of these
61. In an atom, an electron is moving with a speed of 600 m/sec with an uncertainty of 0.005%, uncertainty with which the position of electron can be located is
 (1) 5.10×10^{-3} m
 (2) 1.92×10^{-3} m
 (3) 3.84×10^{-3} m
 (4) 1.52×10^{-4} m
62. The triad of nuclei which are isotones :-
 (1) ${}^{14}_6\text{C}$, ${}^{15}_7\text{N}$, ${}^{17}_9\text{F}$ (2) ${}^{14}_6\text{C}$, ${}^{14}_7\text{N}$, ${}^{17}_9\text{F}$
 (3) ${}^{13}_6\text{C}$, ${}^{14}_7\text{N}$, ${}^{19}_9\text{F}$ (4) ${}^{14}_6\text{C}$, ${}^{14}_7\text{N}$, ${}^{19}_9\text{F}$
63. In which transition minimum energy is emitted :-
 (1) $\infty \rightarrow 1$ (2) $2 \rightarrow 1$
 (3) $3 \rightarrow 2$ (4) $n \rightarrow (n-1)$ [$n \geq 4$]
64. Which of the following molecular orbital has two nodal planes :-
 (1) σ_{1s} (2) σ_{2s}^*
 (3) σ_{2p_z} (4) $\pi_{2p_x}^*$
65. Calculate the amount of H_2 which is left unreacted in the given reaction :-
 $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
 If 8gm of H_2 is mixed with 16 gm of O_2
 (1) 3gm (2) 6 gm (3) 1 gm (4) 4 gm
66. The equivalent weight of H_3PO_4 in the reaction is
 $\text{Ca}(\text{OH})_2 + \text{H}_3\text{PO}_4 \rightarrow \text{CaHPO}_4 + 2\text{H}_2\text{O}$
 (Ca = 40; P = 31; O = 16) :-
 (1) 49 (2) 98 (3) 32.66 (4) 147
67. The 3d-orbitals having electron density in all the three axes is :-
 (1) $3d_{xy}$ (2) $3d_z^2$ (3) $3d_{yz}$ (4) $3d_{zx}$
68. The number of electrons having $m = -1$ in phosphorus atom is :-
 (1) 3 (2) 4 (3) 6 (4) 9
69. General electronic configuration of lanthanides is :-
 (1) $(n-2)f^{1-14}(n-1)s^2p^6d^{0-1}ns^2$
 (2) $(n-2)f^{0-14}(n-1)d^{0-1}ns^{1-2}$
 (3) $(n-2)f^{0-14}(n-1)d^{10}ns^2$
 (4) $(n-2)d^{0-1}(n-1)f^{1-14}ns^2$
70. Which of the following arrangements of electrons is mostly likely to be stable ? ($z \leq 30$ for this atom):-
 (1) $\begin{array}{|c|c|c|c|c|c|} \hline 3d & & & & & 4s \\ \hline \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \downarrow \\ \hline \end{array}$ (2) $\begin{array}{|c|c|c|c|c|c|} \hline 3d & & & & & 4s \\ \hline \uparrow \downarrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \hline \end{array}$
 (3) $\begin{array}{|c|c|c|c|c|c|} \hline 3d & & & & & 4s \\ \hline \uparrow & \uparrow & \uparrow \downarrow & \uparrow & \uparrow & \downarrow \\ \hline \end{array}$ (4) $\begin{array}{|c|c|c|c|c|c|} \hline 3d & & & & & 4s \\ \hline \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \uparrow \\ \hline \end{array}$
71. Which orbital gives an electron the greatest probability of being found close to the nucleus:-
 (1) 3p (2) 3d
 (3) 3s (4) Equal

72. How many unpaired electrons are in gaseous Fe^{2+} ion in the ground state ?
 (1) 0 (2) 2 (3) 4 (4) 6
73. All of these sets of quantum numbers are permissible except :-

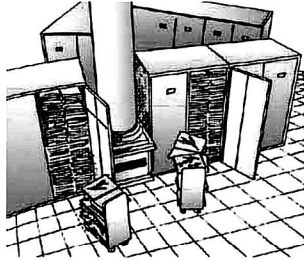
	n	l	m_l	m_s
(1)	1	0	0	+1/2
(2)	2	2	0	-1/2
(3)	3	1	1	-1/2
(4)	3	2	-1	+1/2
74. According to Schrodinger model nature of electron in an atom is as :-
 (1) Particles only
 (2) Wave only
 (3) Both simultaneously
 (4) Sometimes waves and sometimes particles
75. The largest number of molecules is in :-
 (1) 8g of hydrogen
 (2) 28 g of CO
 (3) 92 g of $\text{C}_2\text{H}_5\text{OH}$
 (4) 56 g of N_2
76. When the same amount of zinc is treated separately with excess of sulphuric acid and excess of sodium hydroxide, the ratio of volumes of hydrogen evolved is :-
 (1) 1 : 1 (2) 1 : 2
 (3) 2 : 1 (4) 9 : 4
77. Which of the following samples contains the largest number of atoms ?
 (1) 1 g of Ni(s) (2) 1 g of Ca(s)
 (3) 1 g of N_2 (g) (4) 1 g of B(s)
78. Which one of the following isotopes has exactly 19 neutrons ?
 (1) ^{35}Cl (2) ^{19}F (3) ^{35}S (4) ^{39}K
79. In how many elements does the outer most electron has quantum numbers $n = 4, l = 0, m = +1$
 (1) 2 (2) 14 (3) 0 (4) 12
80. How many electrons are gained by one mole of permanganate ions when permanganate ions react with reducing agents in acid solution to form manganese (II) ions ?
 (1) 5 (2) 6.02×10^{23}
 (3) $(6.02 \times 10^{23})/5$ (4) $5 \times 6.02 \times 10^{23}$
81. The orbital angular momentum of a p-electron is given as :-
 (1) $\sqrt{\frac{3}{2}} \frac{h}{\pi}$ (2) $\sqrt{6} \cdot \frac{h}{2\pi}$
 (3) $\frac{h}{\sqrt{2}\pi}$ (4) $\sqrt{3} \frac{h}{2\pi}$
82. The number of atoms in 0.1 mol of a triatomic gas is :- ($N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$)
 (1) 1.800×10^{22} (2) 6.026×10^{22}
 (3) 1.806×10^{23} (4) 3.600×10^{23}
83. In a metal chloride the ratio of metal and chlorine is 1 : 1 by wt. Equivalent weight of metal is :-
 (1) 35.5 (2) 17.75 (3) 71 (4) 1
84. Calculate the number of electrons present in Mn^{+2} for $m = 0$ and $s = +\frac{1}{2}$:-
 (1) 4 (2) 6 (3) 11 (4) 10
85. The $[\text{OH}^-]$ in 10^{-7} N NaOH solution is :-
 (1) 10^{-7} M (2) $2 \times 10^{-7} \text{ M}$
 (3) 7 (4) $5 \times 10^{-8} \text{ M}$
86. The wavelength of 3rd line of Balmer series for H atom is :-
 (1) $\frac{21}{100R}$ (2) $\frac{100}{21R}$ (3) $\frac{21R}{100}$ (4) $\frac{100R}{211}$
87. The volume in litres of CO_2 liberated at STP when 10 gm of 80% pure limestone is heated completely is :-
 (1) 22.4 litres (2) 2.24 litres
 (3) 20.16 litres (4) 1.8 litres
88. The radius of Bohr's first excited state is a_0 . The electron in n^{th} orbit has a radius :-
 (1) $\frac{n^2 a_0}{4}$ (2) $\frac{a_0}{n}$ (3) $n^2 a_0$ (4) $\frac{a_0}{n^2}$
89. The first line of Balmer series in the hydrogen spectrum will have the frequency :-
 (1) $4.57 \times 10^{14} \text{ s}^{-1}$ (2) $3.29 \times 10^{15} \text{ s}^{-1}$
 (3) $8.22 \times 10^{15} \text{ s}^{-1}$ (4) $8.05 \times 10^{13} \text{ s}^{-1}$
90. 12 g of Mg will react completely with an acid to give :-
 (1) 1 mol of O_2 (2) $\frac{1}{2}$ mol of H_2
 (3) 1 mol of H_2 (4) 2 mol of H_2

BIOLOGY

91. Which statement is/are correct regarding heterocyst?
(1) It is non photosynthetic
(2) Can fix atmospheric nitrogen
(3) Found in *Nostoc*
(4) All the above
92. Phylogenetic classification is the one which is based on
(1) overall similarities
(2) utilitarian system
(3) habits of plants
(4) evolutionary descent
93. Echinodermata from the options.
(1) Sea urchin, cuttle fish and sea lily
(2) *Echinus*, sea hare and sea cucumber
(3) *Antedon*, *Ophiura* and *Echinus*
(4) *Ophiura*, *Chaetopleura* and *Echinus*
94. Which one is not a defining property of living organisms ?
(1) Growth
(2) Metabolism
(3) Consciousness
(4) Intrinsic growth
95. Protista includes ?
(1) Unicellular eukaryotes
(2) Multicellular prokaryotes
(3) Unicellular prokaryotes
(4) All of these
96. Choose the incorrect statement about Ascomycetes:-
(1) Mycelium is branched and septate
(2) Sexual spores are produced endogenously
(3) They have sac like structure in which karyogamy takes place
(4) Reduction division occurs in fruiting bodies and form conidia
97. Pigment in blood of earthworm is :-
(1) Porphyrin (2) Haemoglobin
(3) Chlorophyll (4) Erythrocrucorin
98. Body cavity of cockroach is :-
(1) True coelom (2) Haemocoel
(3) Gonocoel (4) Both (1) & (2)
99. Which of the following option is incorrect about bacterial plasmid ?
(1) Extra nuclear DNA
(2) Auto replicating structure
(3) Lack of vital genes
(4) Single stranded DNA
100. Several blue green algae have the capacity of changing their colour in relation to incident wavelength of light. This phenomenon is called
(1) Water blooming
(2) Photoperception
(3) Guadikov phenomenon
(4) Warbug phenomenon
101. Which fungi causes rust and smut diseases respectively?
(1) *Ustilago* and *Agaricus*
(2) *Puccinia* and *Ustilago*
(3) *Puccinia* and *Agaricus*
(4) *Ustilago* and *Puccinia*
102. The most primitive of the bilaterally symmetrical organism is :-
(1) Earthworm (2) Fluke
(3) *Ascaris* (4) *Leucosolenia*
103. Which of the following is correct for a virus?
(1) They have only one type of nucleic acid.
(2) They replicate inside only animal cell.
(3) They are always living.
(4) They are bigger than bacteria and they kill them.
104. Which one of the following is found in vertebrates, but not found in non-chordates?
(1) Gills
(2) Chitinous exoskeleton
(3) Post anal tail
(4) Neurogenic heart
105. Which one of the following invertebrate is a deuterostome and enterocoelous coelomate?
(1) *Aphrodite* (2) *Ascaris*
(3) *Octopus* (4) *Astarias*
106. In which of the following, flat worm shows resemblance with coelenterata?
(1) Body plan
(2) Level of organisation
(3) Mode of life
(4) Symmetry

107. Which one of the following is not a digenetic creature?
- (1) *Plasmodium ovale*
 - (2) *Taenia solium*
 - (3) *Entamoeba histolytica*
 - (4) *Trypanosoma gambiense*

108.



(A)



(B)

First of all identify the A and B then their correct function and they are made for which type of organisms. Which one of these options is most correct with respect to identification, uses and about the organisms :-

		Identification	Uses	Made for
(1)	A	Herbarium	For taxonomy of Plants	Plant species
	B	Zoological park	For taxonomy of animals only	Animal species
(2)	A	Zoological park	For taxonomy of animals	Animal species
	B	Herbarium	For taxonomy of plants	Plant species
(3)	A	Herbarium	For taxonomy of both plants and animals	For both plants and animals
	B	Zoological park	For taxonomy of both plants and animals	For both plants and animals
(4)	A	Museum	For taxonomy of both plants and animals	For both plants and animals
	B	Zoological park	For taxonomy of both plants and animals	For both plants and animals

109. Find the **incorrect** statements from the following:-
- (1) Growth, reproduction and consciousness are unique features of living organisms
 - (2) Growth and reproduction are defining characteristics of living organisms
 - (3) Metabolism, cellular organisation and consciousness are defining characters of livings.
 - (4) Living organisms are self replicating, evolving and self regulating.
110. Which is a group of organisms in which reproduction is synonymous with growth :-
- (1) *Amoeba*, Bacteria and Unicellular Algae
 - (2) Algae, Fungi and Lichen
 - (3) Lower organisms
 - (4) Higher multicellular organisms
111. Find the **incorrect** match
- (A) Botanical gardens – Have collection of living plants
 - (B) Zoological parks – Have collection of living animal
 - (C) Biological museum – Have collection of preserved animals only
 - (D) Taxonomical keys – Are used for identification of plants only
- (1) A & B
 - (2) B & C
 - (3) C & D
 - (4) A & D
112. An order can be best defined as :-
- (1) A group of related species and genera of differant taxa
 - (2) A group of related families which exhibit a few similar characters
 - (3) A group of related classes which exhibit a few similarites
 - (4) An assemblage of genera related to different classes
113. The relation of solanaceae and convolvulaceae with polyoniales is similar to the relation occuring in :-
- (1) Felidae and canidae with carnivora
 - (2) Primata and carnivora with mammalia
 - (3) Amphibia and eptika with chordata
 - (4) Solanum and petunia with solanaceae

114. Skeleton of animals are collected in :-
 (1) Zoological parks (2) Zoos
 (3) Museum (4) Taxonomic keys
115. Find the incorrect statement about fungi :-
 (1) They show a great diversity in morphology and habitats
 (2) Fungi are cosmopolitan and occur in air, water, soil and as parasites also
 (3) They prefer to grow in cold and dry places
 (4) With the exception of yeasts, fungi are filamentous
116. (a) Cellular level body
 (b) mostly marine
 (c) Internal fertilisation
 (d) Indirect development
 (e) Free living planula larva is present.
 In the above given statements which do not suit to proifera.
 (1) a, b, e (2) only e (3) d, e (4) a, d, e
117. Select the animals having schizocoelomic condition:-
 (1) Echinococcus, Earthworm, octopus
 (2) Taenia, fasciola, Asterias
 (3) Wuchreria, Nereis, Cucumaria
 (4) Hirudianaria, Dentalium, locusta
118. Select the phylums having only marine animals:-
 (1) Porifera, ctenophora, coelenterata, Mollusca
 (2) Hemichrodata, coelenterata, Arthropoda, Echinodermata
 (3) Hemichordata, protochordata, porifera, coelenterata
 (4) Echinodermata, urochordata, ctenophora, Hemichordata
119. Select the correct matching set of animal with its larva:
 (1) Aurelia- Parenchymula
 (2) Leucosolenia- Planula
 (3) Starfish-Bipinnaria
 (4) Musca caterpillar
120. Which animal has been placed in wrong Habitat :-
 (1) Hydra-freshwater
 (2) Spongilla-fresh water
 (3) Pennatula-sea water
 (4) Penguin-Aerial mode

121. Choose the correct option.
 (1) Annelida – Exhibit bilateral symmetry, metamerism and coelom.
 (2) Echinodermata – Exhibit tissue level organisation and radial symmetry.
 (3) Arthropoda – Exhibit incomplete digestive system and segmentation.
 (4) Notochord is present on ventral side in vertebrate.

122. Which of the following is not an obligate category?
 (1) Class (2) Genus (3) Kingdom (4) Series

123. Match the following columns. Mark the most appropriate match only.

	Column-I		Column-II
A	Ctenophora	I	Bilateral symmetry
B	Cnidaria	II	Comb plates
C	Platyhelminthes	III	Radial symmetry
D	Echinodermata	IV	Tissue level of organisation








Codes:

- | A | B | C | D |
|---------|-----|----|-----|
| (1) IV | I | II | III |
| (2) III | II | I | IV |
| (3) II | IV | I | III |
| (4) I | III | IV | II |

124. Which of the following statement is incorrect for hemichordates?
 A. Excretion by general body surface.
 B. Body contains proboscis, collar and trunk
 C. Body is schizocoelomic
 D. Respiration by proboscis gland
 (1) A, B & D (2) B & C
 (3) A, C & D (4) A, B & C

125. Which of the following can be called as infection RNA :-
 (1) Bacteriophage
 (2) gemini viruses
 (3) Prions
 (4) Viroids

126. Match the following columns:

Column I	Column II
A 	1 
B 	2 
C 	3 
	4 

Codes:

A	B	C
(1) 2	3	4
(2) 3	4	2
(3) 4	3	1
(4) 1	2	3

127. Which of the following is correct pair :-

- (1) Gastropod mollusc-Closed circulation
- (2) *Aurelia*-Metagenesis
- (3) *Pleurobrachia*-Bilateral symmetry
- (4) *Taenia solium*-Digenetic

128. Which one of the following is not the characteristic of chrysophytes ?

- (1) They float passively on water current
- (2) Most of them are photosynthetic
- (3) Their cell walls form two thin overlapping shells
- (4) Most of them have two flagella, one lies longitudinally and the other transversely in a furrow

129. Match the column :-

Column-I	Column-II
A Black rust of wheat	i Puccinia
B Loose smut of wheat	ii Ustilago tritici
C Late blight potato	iii Phytophthora
D White rust of crucifer	iv Albugo

- (1) A - (i), B - (ii), C - (iii), D - (iv)
- (2) A - (ii), B - (i), C - (iii), D - (iv)
- (3) A - (iii), B - (ii), C - (i), D - (iv)
- (4) A - (iv), B - (iii), C - (ii), D - (i)

130. Mycorrhiza is :-

- (1) Symbiotic association between algae and fungi
- (2) Symbiotic association between fungi and animal
- (3) Symbiotic association between plant and animal
- (4) Symbiotic association between fungi and roots of higher plants

131. Human liver fluke depends on two intermediate host to complete its life cycle they are :-

- (1) Snail and Frog
- (2) Snake and Fish
- (3) Snail and Fish
- (4) Snake and Frog

132. Mark out the correct statements

- (I) Mesosomes are specialised differentiated form of cell membrane.
- (II) Glycocalyx is not the part of cell envelope
- (III) Mesosome helps in distribution of DNA to the daughter cells in prokaryotes.
- (IV) Fimbriae could be helpful in attaching the bacteria to the substrate.
- (V) Chromatophores are the reserve food of cyanophycean cell.

- (1) II, III and IV
- (2) I, II and V
- (3) I, III and IV
- (4) I, II and III

133.

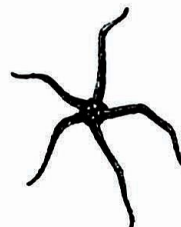
(A)



(B)



(C)



(D)



Identify the above given animal.

	A	B	C	D
(1)	Adamsia	Brachiostoma	Dantalium	Cockroach
(2)	Aurelia	Saccoglossus	Antedon	Scorpion
(3)	Pleurobrachia	Ascidia	Ophiura	Locust
(4)	Ctenoplana	Salpa	Asterias	Prawn

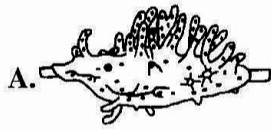
134. The unit of protein coat of virus is called :-

- (1) Capsid (2) Cosmid
(3) Capsomere (4) paplomer

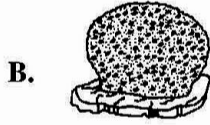
135. Match the following columns.

Column-I

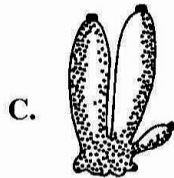
Column-II



1. *Spongilla*



2. *Euspongia*



3. *Sycon*

Codes:

- | A | B | C |
|-------|---|---|
| (1) 3 | 2 | 1 |
| (2) 2 | 3 | 1 |
| (3) 1 | 2 | 3 |
| (4) 3 | 1 | 2 |

136. Which of the following is a symbiotic nitrogen fixer?

- (1) *Glomus* (2) *Azotbactor*
(3) *Frankia* (4) *Azolla*

137. Which group in Bentham and Hooker's classification is same to Phanerogamia of Eichler?

- (1) Spermatophyta (2) Cryptogamia
(3) Dicotyledonae (4) Gymnospermae

138. Clamp junction are present in ?

- (1) Ascomycetia
(2) Basidiomycetia
(3) Phycomycetia
(4) Deutiriomycetia

139. Cnidoblast in cnidarian are used for :-

- (1) Defence only
(2) Defence and food capturing
(3) Food capturing only
(4) Anchorage, defence and food capturing

140. Choose the animals that belong to phylum-Echinodermata from the options.

- (1) Sea urchin, cuttle fish and sea lily
(2) *Echinus*, sea hare and sea cucumber
(3) *Antedon*, *Ophiura* and *Echinus*
(4) *Ophiura*, *Chaetopleura* and *Echinus*

141. Which animal is triploblastic with tube within tube body plan and embryonic blastopore forms mouth.

- (1) *Meandrina* (2) *Leucosolenia*
(3) *Wuchreria* (4) *Physalia*

142. The members of phylum Aschelminthes are :-

- (1) Free living
(2) Parasite
(3) Free living & Parasite both
(4) Mostly free living & some endoparasite

143. Match column-A with column-B :-

	Column-A		Column-B
(a)	<i>Apis</i>	(i)	King crab
(b)	<i>Lacifer</i>	(ii)	Silk worm
(c)	<i>Limulus</i>	(iii)	Honey bee
(d)	<i>Bombyx</i>	(iv)	Mosquitoes
		(v)	Lac insect

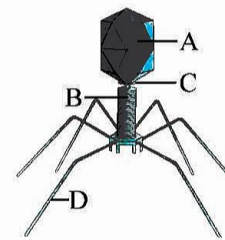
(1) a-(iii), b-(ii), c-(i), d-(v)

(2) a-(iii), b-(v), c-(i), d-(ii)

(3) a-(ii), b-(v), c-(i), d-(iii)

(4) a-(i), b-(v), c-(iii), d-(ii)

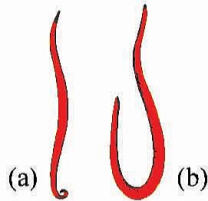
144. Given below is the diagram of a bacteriophage. In which one of the options, all the four parts A, B, C and D are correct ?



- | A | B | C | D |
|-----------------|-------------|--------|-------------|
| (1) Tail fibres | Head | Sheath | Collar |
| (2) Sheath | Collar | Head | Tail fibres |
| (3) Head | Sheath | Collar | Tail fibres |
| (4) Collar | Tail fibres | Head | Sheath |

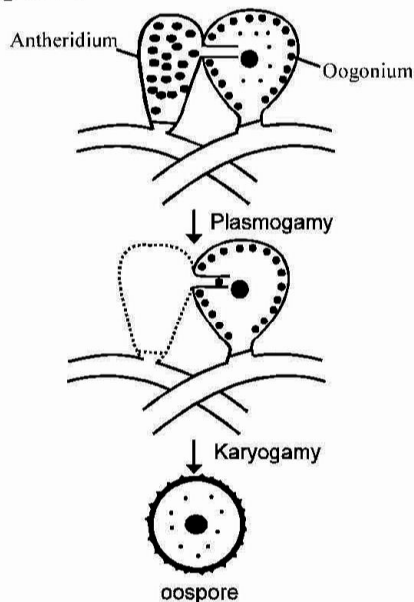


145. Identify the organism in the given diagram and their phylum



	Organism	Phylum
(1)	a-male and b-female ascaris	Aschelminthes
(2)	a-female and b-male ascaris	Aschelminthes
(3)	a-male earthworm and b-female earthworm	Annelida
(4)	a-female ascaris and b-male ascaris	Annelida

146. Which is a correct identification of the given diagram ?



- (1) Planogametic copulation
- (2) Gametangial contact
- (3) Gametangial copulation
- (4) Spermatization

147. Mango belongs to which family ?

- (1) Anacardiaceae
- (2) Poaceae
- (3) Liliaceae
- (4) Solanaceae

148. Which character is true for adamsia :-

- (1) Polyp stage
- (2) Medusa stage
- (3) Meta genesis
- (4) All

149. Keys are made for the taxonomy of :-

- (1) Families of plants only
- (2) Families of animals only
- (3) Species of plants only
- (4) Families or species of both plants and animals

150. Match the two columns (Column-I & column-II)

Column-I		Column-II	
(a)	Order	(i)	A unit of classification made of related genera
(b)	Zoological park	(ii)	Generally identified on the basis of aggregates of character
(c)	Botanical garden	(iii)	Only living animals of taxonomic importance in it
(d)	Family	(iv)	A unit of classification made of related families
		(v)	Only living plants of taxonomic importance in it

- (1) a-i, b-ii, c-iii, d-iv
- (2) a-i, b-ii, c-iii, d-v
- (3) a-ii, b-iv, c-v, d-iii
- (4) a-iv, b-iii, c-v, d-i

151. Largest botanical garden of world and Asia are respectively located at :-

- (1) Kew (England) & Padua (Italy)
- (2) Howarh (India) & Kew (England)
- (3) Kew (England) & Lucknow (India)
- (4) Kew (England) & Howarh (India)

152. Which of the following kingdom exhibit heterotrophic ; holozoic and saprophytic mode of nutrition only :-

- (1) Monera
- (2) Protista
- (3) Fungi
- (4) Animalia

153. In symbiotic association between algae and fungi which one is **not correct** about lichen :-

- (1) Algae prepare food for fungi and itself also
- (2) Fungi provide shelter and absorb mineral and water for its partner
- (3) Lichens are very good pollution indicator because they grow in polluted areas only
- (4) In lichens both partners are so close in their association that one would never imagine that they had two different organisms within them

- 154.** Which of the following is not the feature of phylum Arthropoda :-
 (1) They are schizocoelomate animals
 (2) Body is covered by chitinous shell
 (3) Animals contain jointed appendages
 (4) Animals contain bilateral symmetry
- 155.** Which one of the statement is true :-
 (1) All organ system level animals have tube within tube plan
 (2) All blind sac animals contain bigerminal conditions
 (3) Animals having radial symmetry contain blind sac body plan
 (4) All chordates are vertebrates but all vertebrates are not chordates
- 156.** Cockroach is :-
 (1) Ureotelic (2) Uricotelic
 (3) Ammonotelic (4) Aminotelic
- 157.** Find out the incorrect statement in the following :-
 (1) Heterotrophic bacteria are most abundant in nature
 (2) Bacterial structure is very complex & they have very simple behaviour
 (3) Bacteria reproduce mainly by fission
 (4) Archaeobacteria differ from other bacteria in having different cell wall structure
- 158.** The thalloid body of a slime mould (Myxomycetes) is known as :-
 (1) Fruiting body (2) Mycelium
 (3) Protonema (4) Plasmodium
- 159.** Pearls are produced in an oyster around the:-
 (1) Tears of sea mermaids falling in to oyster.
 (2) First drops of rain falling in to oyster in a particular mouth
 (3) Some external particles becoming embaded in skin of oyster
 (4) Eggs of oyster which fail to leave its body
- 160.** Rasping organ in cuttle fish is :-
 (1) Pectoral fin (2) Pelvic fin
 (3) Anterior & posterior dorsal fin (4) Radula
- 161.** Select the peculiar character in sponges :-
 (1) Marine & fresh habitat (2) Tissue level body
 (3) Intracellular digestion (4) Collar cell
- 162.** Mesenchyme is present in :-
 (1) Spongilla (2) Obelia
 (3) Both (4) Pennatula
- 163.** Growth can be measured in terms of ?
 (1) Fresh or dry weight increase.
 (2) Increase in girth of stem.
 (3) Increase in surface area of leaf.
 (4) All the above
- 164.** When the common characteristic goes on decreasing :-
 (1) As we go higher from species to kingdom.
 (2) As we go lower from kingdom to species.
 (3) As we go both lower and higher in taxonomical hierarchy.
 (4) None of these
- 165.** Taxonomist have developed a variety of taxonomic aids to facilitate :-
 (1) Identification of organism
 (2) Naming of organism
 (3) Classification of organism
 (4) All of the above
- 166.** Match the column :-
- | | Column - A | | Column - B |
|-----|------------|-------|-----------------------|
| (A) | Pennatula | (i) | Portuguese man of war |
| (B) | Gorgonia | (ii) | Bath sponge |
| (C) | Meandrina | (iii) | Seapen |
| (D) | Euspongia | (iv) | Sea fan |
| (E) | Physalia | (v) | Brain coral |
- (1) A-iii, B-iv, C-v, D-i, E-ii
 (2) A-iv, B-iii, C-ii, D-v, E-i
 (3) A-iii, B-iv, C-v, D-ii, E-i
 (4) A-iii, B-iv, C-ii, D-v, E-i
- 167.** Metagenesis is present in :-
 (1) Corals (2) Anemones
 (3) Obelia (4) None
- 168.** Select the incorrect statement among the following :-
 (1) Flat worms are mostly endoparasites
 (2) Ctenophora are exclusively marine
 (3) Arthropods are mostly oviparous with direct or indirect development
 (4) Many cartilagenous fishes are oviparous
- 169.** Worm like marine animals are :-
 (1) Protochordates (2) Ctenophores
 (3) Cephalochordata (4) Hemichordata
- 170.** Lencelet is :-
 (1) Hemichordata (2) Vertebrata
 (3) Urochordata (4) Cephalochordata

171. Which one of the following pairs is *mismatched*?
- (1) *Bombyx mori* – Silk
 - (2) *Pila globosa* – Pearl
 - (3) *Apis indica* – Honey
 - (4) *Kenia lacca* – Lac

172. Which one of the following groups of three animals each is *correctly* matched with their one characteristic morphological feature ?

<i>Animals</i>	<i>Morphological feature</i>
(1) Scorpion, Spider, Cockroach	<u>Ventral solid central nervous system</u>
(2) Cockroach, Locust, <i>Taenia</i>	<u>Metameric segmentation</u>
(3) Liver fluke, Sea - anemone, Sea - cucumber	<u>Bilateral symmetry</u>
(4) Centipede, Prawn, Sea urchin	<u>Jointed appendages</u>

173. Which one of the following is a matching pair of a body feature and the animal possessing it ?

- (1) Ventral heart – Scorpion
- (2) Post-anal tail – Octopus
- (3) Ventral central nervous system – Leech
- (4) Pharyngeal gill slits absent in embryo – Chamaeleon

174. In the light of recent classification of living organisms into three domains of life (bacteria, archaea and eukarya), which one of the following statements is *true* about archaea ?

- (1) Archaea completely differ from both prokaryotes and eukaryotes
- (2) Archaea completely differ from prokaryotes
- (3) Archaea resemble eukarya in all respects
- (4) Archaea have some novel features that are absent in other prokaryotes and eukaryotes

175. Virus envelope is known as :-

- (1) Core
- (2) Capsid
- (3) Virion
- (4) Nucleoprotein

176. In the five-kingdom classification, *Chlamydomonas* and *Chlorella* have been included in :

- (1) Plantae
- (2) Monera
- (3) Protista
- (4) Algae

177. What is the correct sequence of taxonomic categories for plant species :-

- (1) Species → order → class → family
- (2) Family → order → class → division
- (3) Kingdom → phylum → order → family
- (4) Family → order → division → kingdom

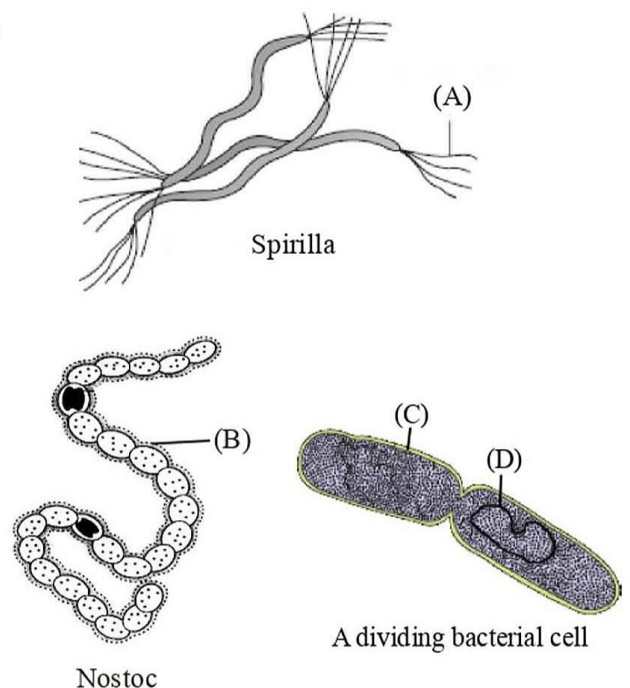
178. Which of the following set animals use water circulation for transportation of different substances in body

- (1) Sponges and coelenterates
- (2) Sponges and chordates
- (3) Cnidarians and Helminthes
- (4) All

179. Which of the following is *incorrect* statement with respect to herbarium :-

- (1) It is a store house of collected plant specimens
- (2) It consists many herbarium sheets arranged in universally accepted system of classification
- (3) Herbarium sheets also have a complete photo profile of the collector of that specimen
- (4) Herbaria also serve as quick referral system in taxonomic studies

- 180.



Identify A, B, C & D from the given diagram:-

	A	B	C	D
(1)	Pili	Cell wall	Cell wall	Cell membrane
(2)	Flagellum	Mucilagenous sheath	cell membrane	DNA
(3)	Flagellum	Slime layer	DNA	RNA
(4)	Pili	Cell membrane	RNA	Nuclear membrane