CLASSROOM CONTACT PROGRAMME
(Academic Session : 2015 - 2016)

LEADER COURSE
PHASE : MLA,MLB,MLC, MLD & MLE
TARGET : PRE-MEDICAL - 2016
Test Type : MAJOR
Test Pattern : AIPMT

TEST DATE : 07 - 03 - 2016

TEST SYLLABUS : SYLLABUS - 03

Important Instructions / महत्वपूर्ण निदेश

1. A seat marked with Reg. No. will be allotted to each student. The student should ensure that he/she occupies the correct seat only. If any student is found to have occupied the seat of another student, both the students shall be removed from the examination and shall have to accept any other penalty imposed upon them.

2. Duration of Test is 3 Hours and Questions Paper Contains 180 Questions. The Max. Marks are 720.

3. Student can not use log tables and calculators or any other material in the examination hall.

4. Student must abide by the instructions issued during the examination, by the invigilators or the centre incharge.

5. Before attempting the question paper ensure that it contains all the pages and that no question is missing.

6. Each correct answer carries 4 marks, while 1 mark will be deducted for every wrong answer. Guessing of answer is harmful.

7. A candidate has to write his/her answers in the OMR sheet by darkening the appropriate bubble with the help of Blue/Black Ball Point Pen only as the correct answer(s) of the question attempted.

8. Use of Pencil is strictly prohibited.

Your Target is to secure Good Rank in Pre-Medical 2016

Note : In case of any Correction in the test paper, please mail to dlpcorrections@allen.ac.in within 2 days along with Paper code and Your Form No.
### PHYSICS
- Gravitation
- Electrostatics and Capacitors
- Current electricity
- Magnetic effect of current and Magnetism

### CHEMISTRY
- Organic Chemistry: Some Basic Principles and Techniques
- Hydrocarbons
- Haloalkanes and Haloarens
- Alcohols, Phenols and Ethers
- Aldehydes, Ketones and Carboxylic Acids
- Organic Compounds Containing Nitrogen (Amines)

### BIOLOGY
- **Genetics and Evolution**: (i) Principles of inheritance and Variation (ii) Evolution
- **Biology in Human Welfare**: (i) Microbes in Human Welfare
- **Biotechnology**: (i) Biotechnology: Principles and Processes (ii) Biotechnology and its Applications
1. Two satellites of mass 50 kg and 100 kg revolve around the earth in circular orbit of radius 9R and 16R respectively, where R is the radius of earth. The speeds of the two satellites will be in the ratio:

   (1) \( \frac{3}{4} \)  
   (2) \( \frac{4}{3} \)  
   (3) \( \frac{9}{16} \)  
   (4) \( \frac{16}{9} \)

2. The radius of a charged metal sphere (R) is 10 cm and its potential is 300 V. Find the charge density on the surface of the sphere:

   (1) \( 2 \times 10^{-3} \) CGS esu  
   (2) \( 4 \times 10^{-3} \) CGS esu  
   (3) \( 6 \times 10^{-3} \) CGS esu  
   (4) \( 8 \times 10^{-3} \) CGS esu

3. A parallel plate capacitor has plates with area A and separation d. A battery charges the plates to a potential difference \( V_0 \). The battery is then disconnected and a dielectric slab of thickness d is introduced. The ratio of energy stored in the capacitor before and after the slab is introduced is:

   (1) K  
   (2) \( \frac{1}{K} \)  
   (3) \( \frac{A}{d^2 K} \)  
   (4) \( \frac{d^2 K}{A} \)

4. A uniform wire of resistance 20 ohm having resistance 1Ω/m is bent in the adjoining form of a circle as shown in the figure. If the equivalent resistance between M and N is 1.8 Ω, then the length of the shorter section is:

   (1) 2m  
   (2) 5m  
   (3) 1.8 m  
   (4) 18 m

5. A charged particle with specific charge \( S \) moves undeflected through a region of space containing mutually perpendicular uniform electric and magnetic fields E & B. When electric field is switched off, the particle will move in a circular path of radius:

   (1) \( \frac{E}{BS} \)  
   (2) \( \frac{ES}{B^2} \)  
   (3) \( \frac{ES}{B^2} \)  
   (4) \( \frac{E}{BS} \)
6. The mass of planet is \( \frac{1}{9} \) of the mass of the earth and its radius is half that of the earth. If a body weight 9N on the earth. Its weight on the planet would be :-

(1) 4 N  
(2) 4.5 N  
(3) 6 N  
(4) None of these

7. A small metal ball is suspended in a uniform electric field with the help of an insulated thread. If a high energy x-ray beam falls on the ball, then the ball :-

(1) will be deflected in the direction of the field  
(2) will be deflected in the direction opposite to the field  
(3) will not be deflected  
(4) will oscillate in the field

8. A number of capacitors each of capacitance 1 \( \mu \text{F} \) and each one of which get punctured if a potential difference just exceeding 500 volt is applied, are provide, then an arrangement suitable for giving a capacitance of 2 \( \mu \text{F} \) across which 3000 volt may be applied requires at least:-

(1) 18 component capacitors  
(2) 36 component capacitors  
(3) 72 component capacitors  
(4) 144 component capacitors

9. In the network shown in the adjoining figure, each resistance is 1 ohm. The effective resistance between A and B is:-

\[
\begin{align*}
\text{A} & \quad \text{B} \\
(1) & (4/3) \Omega \\
(2) & (3/2) \Omega \\
(3) & 7 \Omega \\
(4) & (8/7) \Omega
\end{align*}
\]

10. In the given figure force on wire ABC will be (\( B = 2T \)) :-

(1) 4(3+2\pi) N  
(2) 20 N  
(3) 10 N  
(4) 40 N
11. The weight of a man in a lift moving upwards is 608 N. While the weight of the same man in the lift moving downwards with the same acceleration is 368 N. His normal weight is:

(1) 480 N (2) 588 N (3) 488 N (4) 240 N

12. Two identical balls having like charges and placed at a certain distance apart repel each other with a certain force. They are brought in contact and then moved apart to distance equal to half their initial separation. The force of repulsion between them increases 4.5 times in comparison with the initial value. The ratio of the initial charges of the balls is:

(1) 2 (2) 3 (3) 4 (4) 6

13. A parallel plate capacitor is charged. Then battery is removed now If the plates are pulled apart:

(1) the capacitance increases (2) the potential difference increases (3) the total charge increases (4) the charge and potential difference remains the same

14. Two resistances of 400 Ω and 800 Ω are connected in series with a 6 volt battery of negligible internal resistance. A voltmeter of resistance 10,000 Ω is used to measure the potential difference across 400 Ω. The error in the measurement of potential difference (in volt) approximately is:

(1) 0.01 (2) 0.02 (3) 0.04 (4) 0.05

15. In the given figure magnetic field at centre will be:

(1) \( \frac{\mu_0 I}{8R} \) (2) Zero (3) \( \frac{\mu_0 I}{2\sqrt{2}R} \) (4) \( \frac{\mu_0 I}{4\sqrt{2}R} \)

16. Escape velocity at the surface of earth is 11.2 km/sec. If radius of planet is double that of earth but mean density same as that of earth then the escape velocity will be:

(1) 11.2 km/sec (2) 5.5 km/sec (3) 15.5 km/sec (4) 22.4 km/sec
17. A point charge $q$ is placed in a cavity in a metal block. If a charge $Q$ is brought outside the metal, then the electric force experienced by $q$ is:–
1. proportional to $Q$
2. proportional to $(Q-q)$
3. zero
4. cannot be determined

18. A series combination of $n_1$ capacitors, each of value $C_1$, is charged by a source of potential difference 4V. When another parallel combination of $n_2$ capacitors, each of value $C_2$, is charged by a source of potential difference $V$, it has the same (total) energy stored in it, as the first combination has. The value of $C_2$, in terms of $C_1$, is then:
1. $\frac{2C_1}{n_1n_2}$
2. $\frac{16C_1}{n_1}$
3. $2\frac{n_1}{C_1}$
4. $\frac{16C_1}{n_1n_2}$

19. To get maximum current through a resistance of 2.5 $\Omega$, one can use $m$ rows of cells, each row having $n$ cells. The internal resistance of each cell is 0.5 $\Omega$. What are the values of $n$ and $m$ if the total number of cells is 45?
1. $m=3, n=15$
2. $m=5, n=9$
3. $m=9, n=5$
4. $m=15, n=3$

20. In the given diagram loop tends to:
1. expand
2. Contract
3. rotate about $x$–axis
4. rotate about $y$–axis

21. Maximum height reached by an object projected perpendicular to the surface of the earth with a speed equal to 50% of the escape velocity from earth surface is $- (R = Radius of Earth)$:
1. $\frac{R}{2}$
2. $\frac{16R}{9}$
3. $\frac{R}{3}$
4. $\frac{R}{8}$
22. A spherical charged conductor has surface charge density \( \sigma \). The electric field on its surface is \( E \) and electric potential of conductor is \( V \). Now the radius of the sphere is halved keeping the charge to be constant. The new values of electric field and potential would be:-

(1) \( 2E, 2V \)  
(2) \( 4E, 2V \)  
(3) \( 4E, 4V \)  
(4) \( 2E, 4V \)

23. In an electrolyte \( 3.2 \times 10^{18} \) bivalent positive ions drift to the right per second while \( 3.6 \times 10^{18} \) monovalent negative ions drift to the left per second. The current is:-

(1) \( 1.6 \text{ amp to the left} \)  
(2) \( 1.6 \text{ amp to the right} \)  
(3) \( 0.45 \text{ amp to the left} \)  
(4) \( 0.45 \text{ amp to the right} \)

24. A current flows in a wire of circular cross-section with the free electrons travelling with a mean drift velocity \( \vec{\nu} \). If an equal current flows in a wire of twice the radius, new mean drift velocity is:-

(1) \( \vec{\nu} \)  
(2) \( \frac{\vec{\nu}}{2} \)  
(3) \( \frac{\vec{\nu}}{4} \)  
(4) none of these

25. In the figure shown, a charge \( q \) moving with a velocity \( v \) along the x-axis enter into a region of uniform magnetic field. If particle is able to enter the region \( x > b \) then velocity \( v \) should be greater than :-

\[
\begin{align*}
\text{Y} & \quad \text{X} \\
\begin{array}{c|c|c|c|c|c|c|c|c}
\text{Y} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} \\
\hline
v & a & q, m & \times & \times & \times & \times & \times & \times \\
\hline
\end{array}
\end{align*}
\]

(1) \( \frac{qBb}{m} \)  
(2) \( \frac{qBa}{m} \)  
(3) \( \frac{qB(b-a)}{m} \)  
(4) \( \frac{qB(b+a)}{2m} \)

26. Radius of the earth is \( R \). If a body is taken to a height \( 3R \) from the surface of the earth than change in potential energy will be :-

(1) \( 3mgR \)  
(2) \( \frac{3}{2} mgR \)  
(3) \( mgR \)  
(4) \( \frac{3}{4} mgR \)
27. Six charges are placed at the vertices of a regular hexagon as shown in the figure. The electric field on the line passing through point O and perpendicular to the plane of the figure at a distance of x >> a from O is:

\[ E = \frac{Qa}{\varepsilon_0 x^3} \]  

(1) \( \frac{Qa}{\varepsilon_0 x^3} \)  

(2) \( \frac{2Qa}{\varepsilon_0 x^3} \)  

(3) \( \sqrt[3]{\frac{Qa}{\varepsilon_0 x^3}} \)  

(4) zero

28. A cell of emf E and internal resistance \( r \) is connected in series with an external resistance \( nr \). Then, the ratio of the terminal potential difference to emf is:

(1) \( \frac{1}{n} \)  

(2) \( \frac{1}{n+1} \)  

(3) \( \frac{n}{n+1} \)  

(4) \( \frac{n+1}{n} \)

29. Two long straight wires, each carrying a current I in opposite direction are separated by a distance R. The magnetic induction at a point midway between the wire is:

(1) Zero  

(2) \( \frac{\mu_0 I}{\pi R} \)  

(3) \( \frac{2\mu_0 I}{\pi R} \)  

(4) \( \frac{4\mu_0 I}{4\pi R} \)

30. In the given diagram a rod is rotating with angular velocity \( \omega \). Mass of this rod is \( m \), charge \( q \) and length \( \ell \) then find out magnetic moment of this rod:

\[ \mu = \frac{q\ell^2}{6} \]  

(1) \( \frac{q\ell^2}{6} \)  

(2) \( \frac{q\ell^2}{2} \)  

(3) \( \frac{q\ell^2}{3} \)  

(4) 0

31. Three particles of equal mass \( m \) are situated at the vertices of an equilateral triangle of side \( \ell \). They are moving in a circle in influence of their mutual gravitational interaction. Then their time period of revolution is directly proportional to:

(1) \( \ell^{1/2} \)  

(2) \( \ell^{1/2} \)  

(3) \( \ell^{3/2} \)  

(4) \( \ell^{3/2} \)
32. A thin spherical conducting shell of radius R has charge q. Another charge Q is placed at the centre of the shell. The electrostatic potential at a point P at a distance R/2 from the centre of the shell is:

\( \left( \begin{array}{c}
1 \frac{2Q}{4\pi\varepsilon_0 R} \\
2 \frac{(q+Q)^2}{4\pi\varepsilon_0 R} \\
3 \frac{2Q}{4\pi\varepsilon_0 R} - \frac{2q}{4\pi\varepsilon_0 R} \\
4 \frac{2Q}{4\pi\varepsilon_0 R} + \frac{q}{4\pi\varepsilon_0 R}
\end{array} \right) \)

33. Twelve equal resistors, each of resistance R, are connected to form a skeleton cube. Then, the equivalent resistance taken between two diagonally opposite corners is:

\( \left( \begin{array}{c}
1 R \\
2 12R \\
3 5R/6 \\
4 7R/2
\end{array} \right) \)

34. Equal currents are flowing in three infinitely long wires along positive x, y and z direction. The magnetic field at a point (0, 0, -a) would be (i = current in each wire):

\( \left( \begin{array}{c}
1 \frac{\mu_0 I}{2\pi a} (j - i) \\
2 \frac{\mu_0 I}{2\pi a} (i - j) \\
3 \frac{\mu_0 I}{2\pi a} (i + j) \\
4 \frac{\mu_0 I}{2\pi a} (-i - j)
\end{array} \right) \)

35. At curie point, a ferromagnetic material becomes:

\( \left( \begin{array}{c}
1 \text{ Non magnetic} \\
2 \text{ Diamagnetic} \\
3 \text{ Paramagnetic} \\
4 \text{ Strongly ferromagnetic}
\end{array} \right) \)

36. The electric field \( \mathbf{E} \) between two points is constant in both magnitude and direction. Consider a path of length d at an angle \( \theta = 60^\circ \) with respect to field lines shown in figure. The potential difference between points 1 and 2 is:

\( \left( \begin{array}{c}
1 \frac{E}{d\cos 60^\circ} \\
2 Ed \cos 60^\circ \\
3 \frac{Ed}{\cos 60^\circ} \\
4 \frac{E}{d\cos 60^\circ}
\end{array} \right) \)
37. Two particles each of mass \( m \) and charge \( q \) are separated by distance \( r_1 \) and the system is left free to move at \( t = 0 \). At time \( t \) both the particles are found to be separated by distance \( r_2 \). The speed of each particle is:

(1) \( \frac{qm}{4\pi\epsilon_0 r_1 r_2} \)

(2) \( \frac{q}{r_1 r_2 \sqrt{(r_2^2 - r_1^2)/4\pi\epsilon_0 m}} \)

(3) \( \frac{\sqrt{2}q}{r_1 r_2 \sqrt{(r_2^2 - r_1^2)/4\pi\epsilon_0 m}} \)

(4) none of these

38. Four resistors are connected as shown in the following figure. A 6 V battery of negligible resistance is connected across terminals A and C. The potential difference across terminals B and D will be:

(1) zero

(2) 1.5 voltage

(3) 2 volts

(4) 3 volts

39. A long straight wire of radius 'a' carries a steady current \( i \). The current is uniformly distributed across its cross section. The ratio of the magnetic field at distance \( a/2 \) and \( 2a \) is:

(1) 1/2

(2) 1/4

(3) 4

(4) 1

40. Two tangent galvanometer coils of same radius connected in series. The current flowing produces deflection of 60° & 45°. The ratio of number of turns in coil is:

(1) \( \frac{4}{3} \)

(2) \( \frac{\sqrt{3} + 1}{1} \)

(3) \( \frac{\sqrt{3} + 1}{\sqrt{3} - 1} \)

(4) \( \frac{\sqrt{3}}{1} \)
41. A given charge situated at a distance \( r \) from an electric dipole on its axis experiences a force \( F \). If the distance of the charge from the dipole is doubled, the force acting on the charge will be:

- (1) 4\( F \)
- (2) \( F/2 \)
- (3) \( F/4 \)
- (4) \( F/8 \)

42. Two capacitors \( C_1 \) and \( C_2 \) are connected in a circuit as shown in figure. The potential difference \( (V_A - V_B) \) is:

- (1) 8\( V \)
- (2) \(-8\)\( V \)
- (3) 12 \( V \)
- (4) \(-12\)\( V \)

43. A battery of internal resistance one ohm and emf 3 volt sends a current through 1 metre of uniform wire of resistance 5\( \Omega \). The pole of the cell of emf 1.4 volt are connected to two points on the wire so that no current passes through this cell. Then, the potential gradient of the wire is:

- (1) 2.5 volt
- (2) 2.5 volt/metre
- (3) 3 volt/metre
- (4) 1.5 volt/metre

44. The acceleration of an electron at a moment in a magnetic field \( \mathbf{B} = 2\mathbf{i} + 3\mathbf{j} + 4\mathbf{k} \) is \( \mathbf{a} = x\mathbf{i} - 2\mathbf{j} + \mathbf{k} \). The value of \( x \) is:

- (1) 0.5
- (2) 1
- (3) 2.5
- (4) 1.5

45. Dip angle are 30\( \degree \) & 45\( \degree \) at two different places, then ratio of horizontal component of earth magnetic field at these place will be:

- (1) \( \sqrt{3} : \sqrt{2} \)
- (2) 1 : \( \sqrt{2} \)
- (3) 1 : \( \sqrt{3} \)
- (4) 1 : 2
46. Ozonolysis of which compound gives :-

\[
\begin{align*}
\text{OHC} & \text{CH}_2 \text{CH}_2 \text{CH}_2 \text{CH}_2 \text{C}=\text{O} \\
& \text{(1)} \quad \text{(2)} \\
& \text{(3)} \quad \text{(4)}
\end{align*}
\]

47. The order of decreasing nucleophilicity of the following is :-

(1) \(\text{H}_2\text{O} > \text{OH} > \text{CH}_3\text{COO} > \text{CH}_3\text{O} \)

(2) \(\text{CH}_3\text{O} > \text{OH} > \text{CH}_3\text{COO} > \text{CH}_3\text{SO}_3 \)

(3) \(\text{CH}_3\text{COO} > \text{CH}_3\text{O} > \text{OH} > \text{H}_2\text{O} \)

(4) \(\text{OH} > \text{CH}_3\text{O} > \text{CH}_3\text{COO} > \text{H}_2\text{O} \)

48. Which of the following has maximum reactivity towards nucleophilic attack :-

(1) \(\text{R–C–Cl} \)

(2) \(\text{R–C–R} \)

(3) \(\text{R–C–O–C}_2\text{H}_5 \)

(4) \(\text{R–C–NH}_2 \)

49. Consider following reaction –

\[
\text{Alkene(A)} \xrightarrow{\text{KMnO}_4} \text{CH}_3\text{COO} + \text{CH}_3\text{COOH}
\]

A is :-

(1) \[
\begin{align*}
\text{CH}_3
\end{align*}
\]

(2) \[
\begin{align*}
\text{CH}_3
\end{align*}
\]

(3) \[
\begin{align*}
\text{CH}_3
\end{align*}
\]

(4) \[
\begin{align*}
\text{CH}_3
\end{align*}
\]

46. कौन सा चित्र और जी नी करण द्रा र- निधन दे गा

47. निम्न लिखित में नाता करने हित खाट ता आ क्रम है

(1) \(\text{H}_2\text{O} > \text{OH} > \text{CH}_3\text{COO} > \text{CH}_3\text{O} \)

(2) \(\text{CH}_3\text{O} > \text{OH} > \text{CH}_3\text{COO} > \text{CH}_3\text{SO}_3 \)

(3) \(\text{CH}_3\text{COO} > \text{CH}_3\text{O} > \text{OH} > \text{H}_2\text{O} \)

(4) \(\text{OH} > \text{CH}_3\text{O} > \text{CH}_3\text{COO} > \text{H}_2\text{O} \)

48. नाता करने ही आ क्रम के प्रति निम्न में से कौन सा सब आ क्रम है

(1) \(\text{R–C–Cl} \)

(2) \(\text{R–C–R} \)

(3) \(\text{R–C–O–C}_2\text{H}_5 \)

(4) \(\text{R–C–NH}_2 \)

49. निम्न अभ्यास क्रिया पर विचार करिए

\[
\text{Alkene(A)} \xrightarrow{\text{KMnO}_4} \text{CH}_3\text{COO} + \text{CH}_3\text{COOH}
\]

A है :-

(1) \[
\begin{align*}
\text{CH}_3
\end{align*}
\]

(2) \[
\begin{align*}
\text{CH}_3
\end{align*}
\]

(3) \[
\begin{align*}
\text{CH}_3
\end{align*}
\]

(4) \[
\begin{align*}
\text{CH}_3
\end{align*}
\]
50. In which of the following reaction cyanide will be obtained as a major product?

(1) \( \text{Ph–C} \equiv \text{CH}_3 \xrightarrow{\text{LiAlH}_4} \)

(2) \( \text{Ph–C} \equiv \text{NH}_2 \xrightarrow{\text{NaOH} \text{, Br}_2} \)

(3) \( \text{Ph–C} \equiv \text{NH}_2 \xrightarrow{\text{P, O}_2} \)

(4) \( \text{Ph–C} \equiv \text{O–H} \xrightarrow{\text{SOCl}_2} \xrightarrow{\text{NH}_3} \)

51. Most reactive for decarboxylation is:

(1) \( \text{O} \xrightarrow{\text{O}} \text{OH} \)

(2) \( \text{O} \xrightarrow{\text{O}} \text{OH} \)

(3) \( \text{O} \xrightarrow{\text{O}} \text{OH} \)

(4) \( \text{O} \xrightarrow{\text{O}} \text{Me} \)

52. Alkene \( \xrightarrow{\text{Ozonolysis}} \) 2,6-heptadione

Find alkene:

(1) \( \)

(2) \( \)

(3) \( \)

(4) \( \)

53. Which of the following reacts with the given compound to give orange precipitate:

\( \text{O} \xrightarrow{\text{O}} \text{NH–NH}_2 \)

(1) \( \text{CH}_3–\text{CH}_2–\text{C}–\text{OH} \)

(2) \( \text{CH}_3–\text{CH}_2–\text{OH} \)

(3) \( \text{CH}_3–\text{CH}_2–\text{C}–\text{H} \)

(4) All of these
54. Match list I with list II and then select the correct answer from the codes given below the lists.

<table>
<thead>
<tr>
<th>List I</th>
<th>List II</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Butane → Isobutane</td>
<td>(a) Cracking</td>
</tr>
<tr>
<td>B Butane → Lower hydrocarbons</td>
<td>(b) Isomerisation</td>
</tr>
<tr>
<td>C n-Heptane → Toluene</td>
<td>(c) Reed reaction</td>
</tr>
<tr>
<td>D Propane → CH₂CH₂CH₂SO₂Cl</td>
<td>(d) Aromatization</td>
</tr>
</tbody>
</table>

A     B      C      D
(1) b a d c
(2) b d a c
(3) b c d a
(4) b d c a

55. \[ \text{Product (A)} \]

\[ \text{Product (A)} \]

(1) O=C–CH₃
(2) CH=O
(3) CH –CH CH CH CH –COOH
(2 2 2 2 2)
(4) CH –CH CH CH CH –CH
(2 2 2 2 2 2)

56. 1° amine and 2° Amine can be differentiated by :-
(1) CHCl₃/Alc.KOH  (2) NaNO₂/HCl
(3) PhSO₂Cl then NaOH  (4) All of these

57. Acetone and acetaldehyde can be distinguished by :
(1) Tollen’s test  (2) Iodoform test
(3) Lucas test  (4) NaHCO₃

58. The given reaction is:

\[ \text{Product (A)} \]

(1) Mendius reaction
(2) Stephen’s reaction
(3) Rosenmund’s reduction
(4) Cannizzaro’s reaction

59. \[ \text{B product B is:-} \]

\[ \text{B product B is:-} \]

(1) C₆H₅OH  (2) C₆H₅ONa
(3) C₆H₆  (4) C₆H₅COONa
60. Which of the following compound will not give Iodoform Test :-

(1) $\text{CH}_3\text{CH}_2\text{OH}$  (2) $\text{C}_6\text{H}_5\text{C}=$

(3) $\text{CH}_3\text{C}=$  (4) $\text{CH}_3\text{C}=$

61. In the reaction

$$\text{Pd} + \text{CaCO}_3 \xrightarrow{\text{liq.} \text{NH}_3 + \text{Na}_3} \text{A}$$

A and B are geometrical Isomers. Then :-

(1) A is cis and B is trans
(2) A is trans and B is cis
(3) A and B are cis
(4) A and B are trans

62. $\text{Br}_2 \xrightarrow{\text{H}_2\text{O}}$ Product formed is :

(1) 2,4,6-Tribromoaniline
(2) 2-Bromophenol and 4-Bromophenol
(3) Picric acid
(4) 2,4,6-Tribromophenol

63. $\text{CHCl}_3 \xrightarrow{\text{AlCl}_3} \text{A} \xrightarrow{\text{Cl}_2 \text{ (1 mole) } \text{hv}} \text{B} \xrightarrow{\text{AgCN}} \text{C}$

Which is correct for above reaction :-

(1) $\text{A} = \text{CH}_2\text{Cl}$  (2) $\text{B} = \text{CH}_3$

(3) $\text{C} = \text{CH}_3\text{CN}$  (4) $\text{C} = \text{CH}_3\text{NC}$

64. The correct order of $S_{\text{N1}}$ reactivity is :-

(1) $\text{MeBr} \xrightarrow{\text{I}}$  (II) $\text{MeBr} \xrightarrow{\text{II}}$

(3) $\text{II} > \text{I}$  (4) $\text{III} > \text{I}$
65. Which among the given acids has lowest pKa value
   (1) Chloroacetic acid   (2) Bromoacetic acid
   (3) Nitroacetic acid   (4) Cyanoacetic acid

66. Consider the reaction

   \[ CH_2=CH-CH=CH_3 \overset{CH_2O}{\rightleftharpoons} X \text{ product} \]

   The alkene formed in major amount:
   (1) \( CH_3-CH=CH-CH_3 \)  \( CH_3 \)
   (2) \( CH_3-C=CH_2 \)  \( CH_3 \)
   (3) \( CH_3-CH_2=CH=CH_2 \)  \( CH_3 \)
   (4) Both (1) and (3)

67. (1) Ph \( -C-CH_3 \) \( xNaNH_2 \) \( Br \) \( CH_3 \)

   Ph \( -C \equiv C - CH_3 \)

   (2) \( Br \) \( Br \) \( yNaNH_2 \) \( CH_3 \)

   Sum of \( x + y = ? \)
   (1) 2  (2) 4  (3) 5  (4) 6

68. Which alcohol react readily with Lucas reagent:
   (1) Benzyl alcohol
   (2) p-methoxy benzyl alcohol
   (3) Allyl alcohol
   (4) Vinyl alcohol

69. \( CH_3 \) \( CH \) \( CH \) \( CH \) \( CH_2CH_3 \) \( NBS \) \( \text{Major Product} \)

   (1) \( CH_3 \) \( CH \) \( CH \) \( CH_2CH_3 \) \( Br \)
   (2) \( CH_3 \) \( CH \) \( CH \) \( CH_2CH_3 \) \( Br \)
   (3) \( CH_3 \) \( CH \) \( CH \) \( CH_2CH_3 \) \( Br \)
   (4) \( CH_3 \) \( CH \) \( CH \) \( CH_2CH_3 \) \( Br \)

65. निम्न अनुशासन में से किसका pKa मात्रम होता है?
   (1) च्लोरोएसिटिक अल्डीहेड   (2) ब्रोमोएसिटिक अल्डीहेड
   (3) निट्रोएसिटिक अल्डीहेड   (4) सियानोएसिटिक अल्डीहेड

66. चैंडी-चैंडी-चैंडी-चैंडी \( \overset{CH_2O}{\rightleftharpoons} X \bar{उ} \bar{र} \bar{प} \bar{द} \)

   अधिक ऑक्साइड का उत्पादन है?
   (1) \( CH_3-CH=CH-CH_3 \)  \( CH_3 \)
   (2) \( CH_3-C=CH_2 \)  \( CH_3 \)
   (3) \( CH_3-CH_2=CH=CH_2 \)  \( CH_3 \)
   (4) दोनों (1) और (3)

67. (1) Ph \( -C-CH_3 \) \( xNaNH_2 \) \( Br \) \( CH_3 \)

   Ph \( -C \equiv C - CH_3 \)

   (2) \( Br \) \( Br \) \( yNaNH_2 \) \( CH_3 \)

   \((x + y = ?)\) अधिक मोर्चा है?
   (1) 2  (2) 4  (3) 5  (4) 6

68. ज्वेल रेजेंट से कर्मसूर आलक से ज्वील रेजेंट का कर्मसूर आलक है?
   (1) बेंजील एल्कॉहॉल   (2) पी-मैथोक्सी बेंजील एल्कॉहॉल
   (3) अल्लील एल्कॉहॉल   (4) विनियल एल्कॉहॉल
70. For the given reaction
\[
\begin{array}{c}
\text{R–C–X} \xrightarrow{\text{HOH}} \text{R–C–OH}
\end{array}
\]
Which substrate will give maximum racemisation?

1. \(\text{CH}_3\text{C–C–Br}\)
2. \(\text{CH}_2=\text{CH–C–Br}\)
3. \(\text{CH}_3\text{C–C–OCH}_3\)
4. \(\text{CH}_3\text{C–C–NO}_2\)

71. \(\text{A} \xleftarrow{\text{HBr}} \text{Ph–CH} = \text{C–CH} \xrightarrow{\text{HBr, Peroxide}} \text{B}\), \(\text{A and B is:–}\)

1. \(\text{Ph–CH–CH–CH}_3\) and \(\text{Ph–CH–CH–CH}_3\)
2. \(\text{Ph–CH–CH–CH}_3\) and \(\text{Ph–CH–CH–CH}_3\)
3. \(\text{Ph–CH}_2 \text{C–CH}_3\) and \(\text{Ph–CH–CH–CH}_3\)
4. \(\text{Ph–CH}_2 \text{C–CH}_3\) and \(\text{Ph–CH–CH–CH}_3\)
72. \[
\begin{align*}
\text{NH}_2 & \xrightarrow{\text{NaNO}_2/\text{HCl}} \text{A} \xrightarrow{0^\circ-5^\circ\text{C}} \text{B} \\
\text{CH}_3&-\text{NCH}_3
\end{align*}
\]

73. Incorrect match is :-

(1) \[
\text{CH}_3\xrightarrow{\text{Cl}_2/\text{AlCl}_3(\text{Anhy.})} \text{Friedel craft reaction}
\]

(2) \[
\text{CH}_3+\text{HCN}+\text{HCl} \xrightarrow{\text{Anhy. AlCl}_3} \text{Gattermann aldehyde synthesis}
\]

(3) \[
\text{CH}_3+\text{CHCl}_3 \xrightarrow{\text{Anhy. AlCl}_3} \text{Reimer-Tiemann reaction}
\]

(4) \[
\text{CH}_3-\text{Br}+\text{AgF} \xrightarrow{\text{Water}} \text{Finkelstein reaction}
\]

74. In which reaction racemic mixture is not obtained ?

(1) \[
\text{CH}_3-\text{CH}═\text{CH}-\text{CH}_3+\text{HCl} \rightarrow
\]

(2) \[
\text{Ph}−\text{CH}═\text{Cl}+\text{KCN} \rightarrow
\]

(3) \[
\text{CH}_3−\text{C}−\text{Ph}+\text{HCN} \rightarrow
\]

(4) \[
\text{CH}_3−\text{C}−\text{Me}+\text{HCN} \rightarrow
\]
75. CH₃–CH–CH₂ (i) CH₃MgBr 
(ii) H₂O
(1) CH₃–CH–CH₂OH
(2) CH₃–CH–CH₂–CH₃
(3) CH₃–CH–CH₂
(4) HO–CH₂–CH₂–CH₂–CH₂–OH

76. What is the major product of the following reaction?

\[
\begin{align*}
\text{CH₃CH₂} & \xrightarrow{\text{KMnO₄} + \text{H}^+} \text{CH₃CH₂COOH} \\
\text{CH₃CH₂COOH} & \xrightarrow{\text{KMnO₄} + \text{H}^+} \text{CH₃CH₂COOH} \\
\text{CH₃CH₂COOH} & \xrightarrow{\text{KMnO₄} + \text{H}^+} \text{CH₃CH₂COOH} \\
\text{CH₃CH₂COOH} & \xrightarrow{\text{KMnO₄} + \text{H}^+} \text{CH₃CH₂COOH} \\
\end{align*}
\]
(1) CH₃CH₂COOH 
(2) HOOC 
(3) HOOC 
(4) CH₃COOC

77. Which of the following is least reactive towards SN₂:\-

(1) ClNO₂ 
(2) ClNO₂ 
(3) O₂NClNO₂ 
(4) ClNO₂
78. R is :-

(1) CH₃–  
(2) CH₃–CH₂–  
(3) CH₂–CH–CH₃  
(4) CH₃–CH₂–CH₂–

79. Dichloro carbene form by chloroform and alc. KOH, which reaction involve this carbene:

(1) Schmidt reaction  
(2) Reimer-tiemann reaction  
(3) Carbyl amine reaction  
(4) (2) and (3) both

80. Which of the following get dehydrated most easily :-

(1) 1–Phenyl–2–butanol  
(2) 1–Phenyl–1–butanol  
(3) 2–Phenyl–1–butanol  
(4) 2–Phenyl–2–butanol

81.  

(1) 
(2) 
(3) 
(4)
82. Mixture of PhCHO and HCHO is treated with NaOH, then Cannizzaro reaction involve :-
   (A) Reduction of HCHO
   (B) Oxidation of HCHO
   (C) Reduction of PhCHO
   (D) Oxidation of Ph–CHO
   (1) A, C   (2) A, D
   (3) B, C   (4) B, D

83. Correct order of reactivity in nucleophilic addition reaction is :

   (i)  
   (ii)  
   (iii)  
   (iv)  

   (1) iii > i > ii > iv   (2) iii > ii > i > iv
   (3) ii > iv > i > iii   (4) iv > ii > iii > i

84. Which of the following conformations of n–butane is the least stable –

   (1) Gauche   (2) Anti
   (3) Eclipsed   (4) Fully eclipsed

85. Which of the following conformations of n–butane is the least stable –

   (1) Gauche   (2) Anti
   (3) Eclipsed   (4) Fully eclipsed
86. Which of the following ether is not produced by williamson ether synthesis :

(1) CH₃–C–O–CH=CH₂ (2) Ph–O–

(3) CH≡C–O–CH=CH₂ (4) All of these

87. CH₃–C≡CH

(i) BH–THF

(ii) Hg(OAc)₂/H₂O

CH₃–C≡CH

(i) NaBH₄

(ii) H₂O

Choose the correct option :

(1) (P) & (Q) are identical in nature
(2) (P) & (Q) are geometrical isomer
(3) (P) & (Q) are position isomers
(4) (P) & (Q) are functional isomers

88. Ethylene react with Br₂ give 1,2-Dibromoethane intermediate of reaction is :

(1) CH₂=CH₂ (2) CH₃–CH₂

(3) Br–CH=CH₂ (4) CH₃–CH–Br

89. Which of the following will not give Hoffmann bromamide reaction ?

(1) CH₃–C–NH₂

(2) O

(3) C–NH–Br

(4) C–NH–CH₂

90. The IUPAC name of given compound is :

CH₃–CH–CH–CH=CH₂

(1) 2-Cyano-3-vinylpentane
(2) 2-Methyl-3-vinylpentanenitrile
(3) 3-Ethyl-2-methylpent-4-ene-1-nitrile
(4) 2-Methyl-3-ethylpent-4-ene-1-nitrile
91. Identify the correct match from the column I, II and III and choose the right option :

<table>
<thead>
<tr>
<th>Column-I</th>
<th>Column-II</th>
<th>Column-III</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Corn cob (a) Female flower emerge above level of water (i) Pollen grains released on to the surface of water (1) 1-b-iv; 2-d-ii; 3-a-i; 4-c-iii</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Vallisneria (b) Well exposed stamens (ii) Pollen grains released inside water (2) 2-a-i; 3-d-ii; 4-b-iii; 1-c-iv</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Zostera (c) Pollinators (iii) Feathery stigma and style (3) 1-b-iii; 2-a-i; 3-d-ii; 4-c-iv</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) Bees, wasps (d) Female flower remain submerged in water (iv) Nectar, pollen grains as floral rewards (4) 2-a-iv; 3-b-iii; 4-c-ii; 1-d-i</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

92. In Angiosperm, pollination of pollen grains generally takes place at :-
(1) Single celled stage
(2) Two celled stage
(3) Three celled stage
(4) Four celled stage

93. Which is not a pre zygotic isolation mechanism:-
(1) Geographical isolation
(2) Ecological isolation
(3) Seasonal isolation
(4) Hybrid sterility

94. Tendril of *cucurbita* and thorns and bougainvillea are :-
(1) Vestigial organ (2) Analogous organ (3) Homologous organ (4) Atavism

95. What was the most significant trend in the evolution of modern man from his ancestors :-
(1) Shortening of jaws
(2) Binocular vision
(3) Increasing cranial capacity
(4) Loss of tail
96. Humans are :
(1) Ovoviviparous and sexually reproducing
(2) Viviparous and sexually reproducing
(3) Oviparous and sexually reproducing
(4) zw and zz chromosomes and sexually reproducing

97. In his breeding experiments on garden pea plants, mendel carried out emasculation of those pea plants which were chosen as :-
(1) Female parents
(2) Male parents
(3) Both male and female parents
(4) Male parents in some cases and female parents in others

98. In mice, a mutation results in the production of yellow coat colour, as opposed to the normal gray coat. Crossing yellow mice with normal mice results in equal proportions of normal and yellow mice, whereas crossing yellow mice amongst themselves results in a ratio of 2 yellow : 1 normal progeny. The results suggest that :
(1) More than one gene is involved in conferring the yellow phenotype
(2) The yellow allele is lethal under homozygous condition
(3) The yellow allele exhibits cytoplasmic heredity
(4) The results cannot be explained by any known genetic principles

99. In E.coli lac operon is ultimately controlled by :-
(1) i gene
(2) i gene product
(3) Operator
(4) Environmental conditions

100. Bt cotton plants are :-
(1) Hybrid plants resistant to cotton bollworms which are lepidopteran insects
(2) Hybrid plants resistant to cotton bollworms which are dipteran insects
(3) Transgenic plants resistant to cotton bollworms which are lepidopteran insects
(4) Transgenic plants resistant to cotton bollworms which are dipteran insects
101. Wind pollinated flowers are:
   (1) Small, producing nectar and dry pollen
   (2) Small, brightly coloured, producing large number of pollen grains
   (3) Small, producing large number of dry pollen grains
   (4) Large, producing abundant nectar and pollen

102. Which of the following statement is correct?
   (1) Apomixis is present in some species of Asteraceae and grasses
   (2) Ovule is also known as megasporangium
   (3) Chalaza is the base of ovule
   (4) All of the above

103. Which era is dubbed as the age of prokaryotic microbes:
   (1) Mesozoic (2) Proterozoic (3) Azoic (4) Cambrian

104. The splint bone of present day horse is a vestige of:
   (1) Fourth toe (2) First toe (3) Second toe (4) Second and forth toes in a limb

105. In the given statements which of the following is NOT related with MTP:
   (1) Intentional or voluntary termination of pregnancy before full term
   (2) Significant role in decreasing the population though it is not meant for that purpose
   (3) Legalised in India in 1971
   (4) Relatively safe during third trimester

106. In the given names how many are not accessory ducts:
   Rete testis, uterus, vasa efferentia, vagina, epididymis, oviduct, vas deferens, prostate, mammary lobe.
   (1) 4 (2) 3 (3) 2 (4) 1

107. If a diploid cell contains 4 pairs of homologous chromosomes, how many possible random arrangements of non-homologous chromosomes could occur during metaphase-I?
   (1) 4 (2) 8 (3) 16 (4) 32

108. If a man who is colourblind marries a woman who is homozygous for normal colour vision, the probability of their son being colourblind is:
   (1) 0 (2) 1 (3) 0.5 (4) 0.75
109. In *Lathyrus odoratus* if double heterozygous purple flowered plants are crossed then what would be probability of double homozygous white flowered plants?

\[
\begin{align*}
(1) & \quad \frac{4}{16} \\
(2) & \quad \frac{3}{16} \\
(3) & \quad \frac{2}{16} \\
(4) & \quad \frac{1}{16}
\end{align*}
\]

110. Which of the following options describes RNA interference :-

(1) Antisense RNA molecules block the translation of specific m-RNA molecules
(2) Double-stranded RNA molecules are bound by proteins that block their translation
(3) Double-stranded RNA molecules are cleaved by a nuclease into short interfering RNA molecules
(4) Short interfering RNA molecules bind to the ribosome to prevent the translation of viral m-RNAs

111. Which of following tissue is a potential pollen mother cell?

(1) Sporogenous tissue
(2) Parietal cell
(3) Tapetum
(4) Pollen

112. Which of the following pair has diploid structure.

(1) Nucellus and Integuments
(2) Synergids and megaspore mother cell
(3) Integument and egg cell
(4) Antipodals and synergids

113. The example of recapitulation theory is :-

(1) Embryonic membranes of reptiles
(2) Tadpole larva of frog
(3) Placenta of mammals
(4) Canine teeth of dog

114. Parallelism is :-

(1) Adaptive divergence in evolution
(2) Adaptive convergence of widely different species in evolution
(3) Adaptive convergence of closely related species in evolution
(4) Connecting link in evolution
115. This diagram shows/denotes :-

1. Barrier method, which prevents conception
2. Barrier method, which prevents amenorrhea
3. Barrier method, which prevents ovulation
4. Barrier method, which prevents ejaculation

116. Spermatogenesis involves formation of spermatozoa. In this process spermatogonia are initial cells. In the given below options. Choose the reverse chronological sequence of spermatogenesis :-

1. Spermatogonia → primary spermatocytes → secondary spermatocytes → spermatids → spermatozoa
2. Spermatogonia ← spermatids ← secondary spermatocytes ← primary spermatocytes
3. Spermatogonia ← spermatids ← spermatozoa ← secondary spermatocytes ← primary spermatocytes
4. Spermatogonia → secondary spermatocytes → primary spermatocytes → spermatids → spermatozoa

117. F₁ progeny resembles neither of the two parents in case of :-

1. Complete dominance
2. Incomplete dominance
3. Co-dominance
4. Pleiotropy

118. The accompanying pedigree shows two individuals who are affected with albinism (autosomal recessive). What is the risk that their grandchild will be affected with this disorder :-

1. 25%
2. 50%
3. 12.5%
4. 0%
119. Asymmetry between reciprocal crosses is seen in:-
(1) Pleiotropy
(2) Sex-linked inheritance
(3) Interactions of genes
(4) Autosomal inheritance

120. Which of the following cloning vectors can support the largest size of target DNA:-
(1) Plasmids
(2) Cosmids
(3) BAC
(4) YAC

121. Isobilateral tetrad is present in ?
(1) In monocot plants
(2) In dicot plants
(3) In Halophia
(4) In Magnolia

122. About how long ago was the earth formed :-
(1) 4.6 billion years ago
(2) 10 billion years ago
(3) 3.0 billion years ago
(4) 20 billion years ago

123. Evolution in which the animals of two different gene ecology show too much similarity with one another, as a result of adaptation is termed as :-
(1) Parallel evolution
(2) Retgressive evolution
(3) Progressive evolution
(4) Convergent evolution

124. Correct sequence is :-
(1) Palaeozoic → Mesozoic → Cenozoic
(2) Mesozoic → Archaeozoic → Proterozoic
(3) Palaeozoic → Archaeozoic → Cenozoic
(4) Archaeozoic → Palaeozoic → Proterozoic

125. Which of the following statements is not related to IVF (In-vitro- fertilisation) :-
(1) The zygote or early embryos (with upto 8 blastomeres) could be transferred into the fallopian tube
(2) Embryos with more than 8 blastomeres could be transferred into the uterus
(3) Zygote is formed under stimulated conditions in the laboratory
(4) Semen is artificially introduced either into the vagina or into the uterus

126. Immunologically competent cells are present in:-
(1) Seminiferous tubules
(2) Ovarian stroma
(3) Prostate
(4) Interstitial spaces
127. If a heterozygous round seeded pea plant is crossed with a pea plant having wrinkled seeds, the fraction of progenies having large sized starch grains should be :-

(1) 1/4  (2) 1/2  (3) 3/4  (4) Zero

128. In a cross involving polygenic inheritance where three allele pairs control plant height, the shortest and tallest plants are 6 cm and 24 cm respectively. What height should all F1 progenies display if homozygous 12 cm and 24 cm plants are crossed? (assuming their environments are the same)

(1) 15 cm  (2) 21 cm
(3) 18 cm  (4) 12 cm

129. Medical geneticists usually abbreviate the normal beta-globin gene as b, and the abnormal gene (in this case) as b°. Suppose neither of your patient’s parents has beta-thalassemia. Which of the following options describes the most likely genotypes of both parents?

(1) One is b° and another is b
(2) One is b°b° and another is bb
(3) Both are b°b°
(4) Both are bb°

130. Which of the following combinations of selectable markers will be the most suitable one for a plasmid vector :-

(1) Two antibiotic resistance genes
(2) Two copies of lac z gene
(3) One lac z gene and one antibiotic resistance gene
(4) Just one antibiotic resistance gene

131. Cleistogamous flower produces assured seed, even in the absence of pollinators. Why?

(1) Because, they have fragrance
(2) Because, they remain open
(3) Because, they are autogamous
(4) Because, they are colourful

132. Which of the following is the correct sequence of chemical substrates produced during the origin of life on the earth :-

(1) Water, amino acid, nucleic acid and enzyme
(2) Glucose, amino acid, nucleic acid and protein
(3) Amino acid, ammonium phosphate and nucleic acid
(4) Ammonia, amino acid, protein and nucleic acid
133. "Single step large mutation" were called as "saltation" by :-
(1) Darwin (2) Malthus (3) Devries (4) Miller

134. Two zoogeographical regions separated by high mountain ranges are :-
(1) Palearctic and oriental (2) Oriental and Australian (3) Nearctic and Palearctic (4) Neotropical and Ethiopian

135. Below diagram shows :-
(1) Stage before morula (2) Stage after morula (3) 8-celled stage (4) 16-celled stage

136. In the given diagram, how many cells are diploid?

137. When dominant epistasis is operative between two gene loci, the classical 9 : 3 : 3 : 1 ratio becomes modified into :-
(1) 9 : 3 : 4 (2) 9 : 6 : 1 (3) 12 : 3 : 1 (4) 15 : 1

138. Certain types of cancers can be correlated with specific changes in chromosome structure. In patients suffering from myelogenous leukemia, which of the following chromosome is altered ?
(1) Chromosome 10 (2) Chromosome 11 (3) Chromosome 20 (4) Chromosome 22

133. ‘‘एकल पद बड़े उड़न परते न’t’’ को ‘‘खड़े नूर’’ फिक्स लें :-
(1) डॉ बिंग ने (2) माल ने (3) डिइ जने (4) मिलान ने

134. क्योंकि उन तंत्र लाओं द्वारा पृथ्वी कर देने में अभाव है
(1) पौधा की टिकरा (2) आंतरिक टल (3) याद कर लें (4) फिल्म लें

135. नीचे दिये गये चित्र में किसी को किस का एंड दिखा पिया है

136. नीचे दिये गये चित्र में किसी को किस का एंड दिखा पिया है

137. अंतर्गत जलन पंजीकरण के मध्य प्र 9 8 के प्र करते (epistasis) किसे लाएँ 9 8 3 1 अतु पतन से पतन हो ? जानें
(1) 9 : 3 : 4 में (2) 9 : 6 : 1 में (3) 12 : 3 : 1 में (4) 15 : 1 में

138. विषय इंट अंतर के के साथ के गुण नूर श्रृंखला में परते नूर के साथ जेड़ 1 ब तत्त्व हैं । माइल रू की रूपननात (myelogenous leukemia) के मरी जों में के नस गुण नूर श्रृंखला प्र 4 1 शिक्षित होते हैं
(1) गुण नूर (2) गुण नूर (3) गुण नूर (4) गुण नूर
139. A mechanism that can cause a gene to move from one linkage group to another is :-
(1) Translocation
(2) Inversion
(3) Crossing over
(4) Duplication

140. Biological control of crop pests is based on :-
(1) Predation
(2) Parasitism
(3) Mutualism
(4) Both predation and parasitism

141. The residual persistent nucellus is known as :-
(1) Raphe
(2) Pericarp
(3) Hilum
(4) Perisperm

142. Which one of the following experiments suggest that simplest living organism could not have originated spontaneously from non-living matter: -
(1) Larvae could appear in decaying organic matter
(2) Microbes did not appearing stored meat
(3) Microbes appeared from unsterlized organic matter
(4) Meat was not spoiled, when heated and kept sealed in a vessel

143. Homologous organs explain :-
(1) Convergent evolution
(2) Divergent evolution
(3) Pedogenesis
(4) Prodigality

144. Match the scientist and their contributions in the field of evolution :-

<table>
<thead>
<tr>
<th>Name of the scientist</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Charles darwin</td>
<td>1 Mutation theory</td>
</tr>
<tr>
<td>B Lamarck</td>
<td>2 Germ plasm theory</td>
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<td>C Hugo de vries</td>
<td>3 Philosphie zoologique</td>
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<td>D Ernts Haeckel</td>
<td>4 The origin of species</td>
</tr>
<tr>
<td>E August weis mann</td>
<td>5 Biogenetic law</td>
</tr>
<tr>
<td></td>
<td>6 Essay on population</td>
</tr>
</tbody>
</table>

(1) A-4, B-3, C-1, D-5, E-2
(2) A-4, B-3, C-5, D-1, E-6
(3) A-4, B-6, C-5, D-3, E-1
(4) A-2, B-3, C-1, D-5, E-2
145. During parturition :-
(1) Oxytocin is released from maternal pituitary
(2) Oxytocin is released from foetus pituitary
(3) Oxytocin causes relaxation in pubic symphysis
(4) Oxytocin promotes progesterone release

146. In his classic experiments on pea plants, Mendel did not use :-
(1) Flower colour (2) Seed coat colour
(3) Pod colour (4) Fruit shape

147. The best description for a dihybrid cross would be a cross involving study of :-
(1) Two characters (2) Two traits
(3) Two alleles (4) Two allele pairs

148. If a F1 dihybrid upon test cross gives following results :
++/ab = 52 +a/ab = 453
+b/ab = 447 ab/ab = 48
then the arrangement of a and b genes is :-
(1) Cis-arrangement (2) Trans-arrangement
(3) Both cis- and trans-arrangements (4) a and b are independently assorting genes

149. A person with klinefelter's syndrome can be described as :-
(1) Monosomic (2) Trisomic
(3) Double trisomic (4) Tetrasisomic

150. A genetically engineered micro-organism used successfully in bioremediation of oil spills is a species of :-
(1) Bacillus (2) Pseudomonas
(3) Trichoderma (4) Xanthomonas

151. Which of following is genetic mechanism that prevent self pollination?
(1) Heterostyly (2) Herkogamy
(3) Dichogamy (4) Self incompatibility

152. Haecckel's theory of recapitulation (biogenetic law) means that :-
(1) All organism starts as an egg
(2) Life history of an animal reflects its evolutionary history
(3) Progeny of an organism resembled its parents
(4) Body parts ones lost regenerated
153. Connecting link between annelida and molluscs is:-
(1) Neopilina  (2) Nautilus
(3) Glochidium larva  (4) Vyeliger larva

154. Industrial melanism was an example on by :-
(1) Mimosa pudica  (2) Triticum aestivum
(3) Biston betularia  (4) Rock python

155. In the given statements choose the odd one for menstrual cycle :-
(1) Maximum level of LH during the mid-cycle
(2) Rupturing of graafian follicle and release of egg in form of secondary oocyte
(3) Secretion of large amounts of progesterone
(4) Cyclic changes in external thin membranous layer

156. Representation of an individual's genetic constitution with respect to a single character or a set of characters is called :-
(1) Genotype  (2) Genome
(3) Phenotype  (4) Trait

157. The most common cause of the pleiotropic effect of a gene is :-
(1) The same product of the given gene being involved in different metabolic pathways.
(2) The gene making very different products in different cell types
(3) The DNA sequence of the gene getting changed in cell-specific manner
(4) The gene not functioning in some cells

158. AB blood group is an example of codominance because in a person with this blood group :-
(1) Both A and B antigens are expressed in one RBC
(2) 50% RBCs contain A antigen while remaining 50% contain B antigen
(3) Neither A nor B antigen is expressed in RBCs
(4) Hybrid form of A and B antigens is present in each RBC

159. In a diploid organism, what is the maximum number of alleles that can exist in a population for any given gene :-
(1) 1  (2) 2
(3) 4  (4) Unlimited

160. Main constituent of biogas is :-
(1) Methane  (2) Ethane
(3) Propane  (4) Butane
161. Correct statement for propagule is :-
(1) Employed in place of seed
(2) Parts of root, stem, leaf used for vegetative propagation
(3) Bud for vegetative propagation
(4) All of these

162. A population splits into two or more groups and these groups occupy the different ecological zones and they form new species is known as :-
(1) Allopatric speciation
(2) Sympatric speciation
(3) Ecological speciation
(4) Autotomy

163. Which of the following are homologous organs:-
(1) Wings of birds and locust
(2) Wing of bat and butterfly
(3) Legs of cockroach and frog
(4) Wings of birds and pectoral fins of fish

164. Which of the following statements is correct :-
(1) Homo erectus is the ancestor of man
(2) Cromagnon man's fossil has been found in Ethiopia
(3) Australopithecus is the real ancestor of modern man
(4) Ramapithecus is the direct ancestor of homo sapiens

165. Ovulation occur :-
(1) Between menstruation and proliferative phase
(2) Between menstruation and secretory phase
(3) Between menstruation and luteal phase
(4) Between proliferative phase and secretory phase

166. The allele for wrinkled seed shape in garden peas is considered recessive because :-
(1) It recedes in the F₂ generation when homozygous parents are crossed
(2) The trait associated with this allele is not expressed in heterozygotes
(3) Individuals with this allele have lower fitness than that of individuals with the dominant allele
(4) This allele is less common than the dominant allele (the allele for wrinkled seed shape is a rare mutant)
167. In *Drosophila* Y-chromosome is:-
(1) Essential for male sex determination
(2) Required for development of secondary sex-characters
(3) Required for dosage compensation
(4) Not required for male sex determination

168. In a cross, AaBbCc × aaBbcc, what is the probability of genotype AaBbCc in the progeny?
(1) 1/2 (2) 1/4 (3) 1/8 (4) 1/16

169. The cutting of DNA by restriction endonuclease results in the fragments of DNA. These fragments are separated by a technique known as gel electrophoresis. Given below is a typical agarose gel electrophoresis showing migration of undigested (lane 1) and digested (lanes 2 to 4).
Identify A and B in the given diagram:-

170. The large holes in 'swiss cheese' are due to production of a large amount of CO₂ by a bacterium named:-
(1) *Saccharomyces cerevisiae*
(2) *Escherichia coli*
(3) *Propionibacterium sharmanii*
(4) *Lactobacillus acidophilus*

171. Endosperm in oenothera, Gymnosperm & Angiosperm is:-
(1) n, 2n, 3n (2) 2n, n, 3n (3) 3n, 2n, n (4) 3n, n, 2n

172. Which one of the following is not a living fossil:-
(1) *Archaeopteryx*
(2) *Peripatus*
(3) King crab
(4) Sphenodon
173. Which one of the following in birds, indicates their reptilian ancestry :-
(1) Two special chambers crop and gizzard in their digestive tract
(2) Eggs with a calcareous shell
(3) Scales on their hind limbs
(4) Four chambered heart

174. Homo erectus is the zoological name of :-
(1) Cromagnon man (2) Peking man
(3) Nut cracker man (4) Neanderthal man

175. Which of the following is not related to uterus ?
(1) An inverted pear shape
(2) Single and womb
(3) Tiny finger-like and supported by ligaments
(4) Opens into vagina through a narrow cervix

176. A same sense mutation modifies an allele such that a given codon in m-RNA is changed into :-
(1) A degenerate sense codon
(2) A non-degenerate sense codon
(3) A non-sense codon
(4) Any of these is possible

177. Why does the gene for pattern baldness exhibit dominance in man but acts recessively in woman ?
(1) Baldness gene expression is regulated by hormones
(2) Baldness gene is autosomal
(3) Baldness gene is on X-chromosome
(4) Baldness gene is on Y-chromosome

178. Which of the following factors is not likely to change gene frequency in a population over time ?
(1) Migration
(2) Random mating
(3) Small population size
(4) Natural selection

179. In polymerase chain reaction what will be the chronological order of events that take place :-
(A) Denaturation
(B) Annealing
(C) Extension
(1) B → A → C (2) C → B → A
(3) A → B → C (4) A → C → B

180. Satellite DNA :-
(1) shows high degree of polymorphism in a population
(2) shows high degree of polymorphism with in an individual
(3) Polymorphism in satellite DNA is inheritable from parents to children
(4) All of these