ALL INDIA MOCK TEST

Sample Paper - 3

DURATION : 180 Minutes **MARKS : 720**

Topic Covered

Physics	**: FULL SYLLABUS : 45 Questions**
Chemistry	**: FULL SYLLABUS : 45 Questions**
Biology	**: FULL SYLLABUS : 90 Questions**

Please read the instructions carefully :

1. The test is of **3 hours** duration and Test Booklet contains **180** questions. Each question carries 4 marks. For each correct response, the candidate will get **4 marks**. For each incorrect response, **one mark** will be deducted. The maximum marks are **720**.
2. Use **Blue/Black Ball Point Pen** only for writing particulars on this page/marking responses.
3. Rough work is to be done on the space provided in the Test Booklet only.
4. **On completion of the test, the candidate must handover the Answer Sheet to the invigilator before leaving the Room/Hall. The candidates are allowed to take away this Test Booklet with them.**
5. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your roll no. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
6. Before attempting the question paper ensure that it contains all the pages and no question is missing.
7. Each candidate must show on demand his/her Admission Card to the Invigilator.
8. 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.
9. No candidate, without special permission of the Superintendent or Invigilator, would leave his/her seat.
10. The candidates should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and sign the Attendance Sheet twice.
11. Use of Electronic/Manual Calculator is prohibited.
12. The candidates are governed by all Rules and Regulations of the Board with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of the Board.
13. The candidates will write the Correct Test ID Code as given in the Test Booklet/Answer Sheet in the Attendance Sheet.

Name of the Student (In CAPITALS) : _____

Candidate ID : _____

Candidate Signature : _____ **Invigilator's Signature :** _____

[PHYSICS]

1. The displacement y of a wave travelling in the x-direction is given by,

$y = 10^{-4} \sin\left(600t - 2x + \frac{\pi}{3}\right)$ meter, where x is expressed in meter and t in second. The speed of the wave motion is -

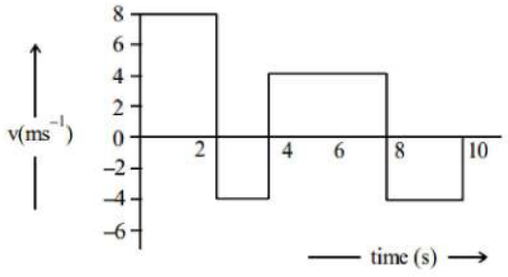
(1) 200 m/s

(2) 300 m/s

(3) 600 m/s

(4) 1200 m/s

2. The velocity time graph of a body moving in a straight line is shown in figure.



The ratio of displacement to distance travelled by the body in time 0 to 10 s is :

(1) 1:1

(2) 1:2

(3) 1:3

(4) 1:4

3. A particle hanging from a spring stretches it by 1 cm at earth's surface. How much will the same particle stretch the spring at a place 800 km above the earth's surface? Radius of the earth = 6400 km.

(1) 0.55 cm

(2) 0.79 cm

(3) 0.85 cm

(4) 0.66 cm

1. x-दिशा में यात्रा करने वाली तरंग का विस्थापन y इस प्रकार दिया जाता है,

$y = 10^{-4} \sin\left(600t - 2x + \frac{\pi}{3}\right)$ मीटर, जहाँ x को मीटर में और t को सेकंड में व्यक्त किया जाता है। तरंग गति की चाल है -

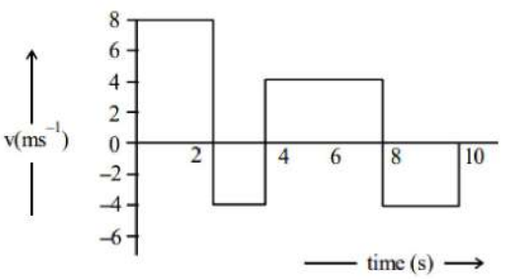
(1) 200 m/s

(2) 300 m/s

(3) 600 m/s

(4) 1200 m/s

2. सरल रेखा में गतिमान एक पिण्ड का वेग-समय ग्राफ चित्र में प्रदर्शित किया गया है।



समय 0 से 10 s में पिण्ड द्वारा तय किये गये विस्थापन का दूरी के साथ अनुपात है :

(1) 1:1

(2) 1:2

(3) 1:3

(4) 1:4

3. एक स्प्रिंग से लटका हुआ कण पृथ्वी की सतह पर उसे 1 सेमी खींचता है। वही कण पृथ्वी की सतह से 800 किमी ऊपर स्प्रिंग को कितना खींचेगा? पृथ्वी की त्रिज्या = 6400 किमी

(1) 0.55 cm

(2) 0.79 cm

(3) 0.85 cm

(4) 0.66 cm

4. Let a wire be suspended from the ceiling (rigid support) and stretched by a weight W attached at its free end. The longitudinal stress at any point of cross-sectional area A of the wire is :

(1) W/A

(2) W/2A

(3) Zero

(4) 2W/A

5. The magnetic moment of paramagnetic materials is :-

(1) Infinity

(2) Zero

(3) Constant but low

(4) None of the above

6. On celcius scale the temperature of body increases by 40°C. The increase in temperature on Fahrenheit scale is-

(1) 68ºF

(2) 70ºF

(3) 72ºF

(4) 75ºF

7. The frequency of the first overtone of a closed organ pipe is equal to the frequency of third harmonic of open organ pipe then ratio of lengths of both pipes :-

(1) 1 : 2

(2) 4 : 1

(3) 8 : 3

(4) 3 : 8

8. A man carrying a monkey on his shoulder does cycling smoothly on a circular track of radius 9 m and completes 120 revolutions in 3 minutes. The magnitude of centripetal acceleration of monkey is (in m/s^2) :

(1) $4\pi^2\,ms^{-2}$

(2) $57600\pi^2\,ms^{-2}$

(3) $16\pi^2\,ms^{-2}$

(4) Zero

4. माना एक तार को किसी छत (दृढ़ आधार) से लटकाया गया है तथा इसके मुक्त सिरे से W भार बाँधकर खींचा जाता है। A अनुप्रस्थ काट क्षेत्रफल के तार के किसी बिन्दु पर अनुदैर्ध्य प्रतिबल है-

(1) W/A

(2) W/2A

(3) शून्य

(4) 2W/A

5. अनुचुम्बकीय पदार्थों का चुम्बकीय आघूर्ण होता है:-

(1) अनन्त

(2) शून्य

(3) नियत लेकिन बहुत कम

(4) इनमें से कोई भी नहीं

6. सेल्सियस पैमाने पर एक वस्तु का तापमान 40°C बढ़ता है। फॉरेनहाइट पैमाने पर ताप वृद्धि है:

(1) 68ºF

(2) 70ºF

(3) 72ºF

(4) 75ºF

7. एक बंद ऑर्गन पाइप के प्रथम अधिस्वर की आवृत्ति खुले ऑर्गन पाइप की तृतीय संनादी की आवृत्ति के बराबर होती है तो दोनों पाइपों की लम्बाइयों का अनुपात है -

(1) 1 : 2

(2) 4 : 1

(3) 8 : 3

(4) 3 : 8

8. एक व्यक्ति एक बन्दर को अपने कंधो पर बैठाकर 9m त्रिज्या के वृत्तीय पथ पर सुविधाजनक तरीके से साईकिल चला रहा है तथा 3 मिनट में 120 चक्कर पूरे करता है। बन्दर के अभिकेन्द्र त्वरण का परिमाण है:

(1) $4\pi^2\,ms^{-2}$

(2) $57600\pi^2\,ms^{-2}$

(3) $16\pi^2\,ms^{-2}$

(4) शून्य

9. Two parallel large thin metal sheets have equal surface charge densities $\left(\sigma = 26.4 \times 10^{-12} \mathrm{C/m^2}\right)$ of opposite signs. The electric field between these sheets is :

(1) 1.5 N/C

(2) $1.5 \times 10^{-10} \mathrm{N/C}$

(3) 3 N/C

(4) $3 \times 10^{-10} \mathrm{N/C}$

10. A small sphere of radius 'r' falls from rest in a viscous liquid. As a result, heat is produced due to viscous force. The rate of production of heat when the sphere attains its terminal velocity, is proportional to -

(1) r^3

(2) r^2

(3) r^5

(4) r^4

11. A circular coil carrying a current has a radius R. The ratio of magnetic induction at the centre of the coil and at a distance equal to $\sqrt{3}$ R from the centre of the coil on the axis is-

(1) 1:1

(2) 1:2

(3) 2:1

(4) 8:1

12. Calculate the surface temperature of the planet, if the energy radiated by unit area in unit time is 5.67×10^4 watt : (Planet may be assumed to black body) $\left(\text{given } \sigma = 5.67 \times 10^{-8}\right)$

(1) $1273^\circ \mathrm{C}$

(2) $1000^\circ \mathrm{C}$

(3) $727^\circ \mathrm{C}$

(4) 727 K

9. दो समांतर बड़ी पतली धातु की शीटें जिनके पृष्ठीय आवेश घनत्व $\left(\sigma = 26.4 \times 10^{-12} \mathrm{C/m^2}\right)$ समान है और चिह्न विपरीत हैं। इन शीटों के मध्य विद्युत क्षेत्र है:

(1) 1.5 N/C

(2) $1.5 \times 10^{-10} \mathrm{N/C}$

(3) 3 N/C

(4) $3 \times 10^{-10} \mathrm{N/C}$

10. 'r' त्रिज्या का एक छोटा गोला विरामवस्था से एक श्यान द्रव में गिरता है। परिणामस्वरूप श्यान बल के कारण ऊष्मा उत्पन्न होती है। जब गोला, सीमान्त वेग प्राप्त कर लेता है तब उत्पन्न ऊष्मा की दर समानुपाती होगी -

(1) r^3

(2) r^2

(3) r^5

(4) r^4

11. एक धारावाही वृत्ताकार कुंडली की त्रिज्या R है। कुंडली के केंद्र पर तथा अक्ष पर कुंडली के केंद्र से $\sqrt{3}$ R दूरी पर चुंबकीय प्रेरण का अनुपात है-

(1) 1:1

(2) 1:2

(3) 2:1

(4) 8:1

12. ग्रह का पृष्ठ ताप परिकलित कीजिए यदि इकाई समय में इकाई क्षेत्रफल द्वारा विकिरित ऊर्जा 5.67×10^4 वॉट है। (ग्रह को कृष्णिका माना जा सकता है)(दिया है $\sigma = 5.67 \times 10^{-8}$)

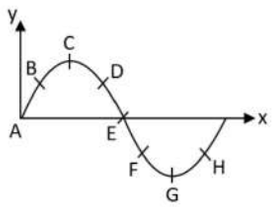
(1) $1273^\circ \mathrm{C}$

(2) $1000^\circ \mathrm{C}$

(3) $727^\circ \mathrm{C}$

(4) 727 K

13. A transverse wave is travelling along a string from left to right. The figure below represents the shape of the string at a given instant. At this instant, the point have an upward velocity are (here X-wave displacement, Y-particle displacement)



(1) D, E, F

(2) A, B, H

(3) B, D, F

(4) A, E, H

14. A player caught a cricket ball of mass 150 g moving at a speed of 20 m/s. If the catching process is completed in 0.1s, the magnitude of force exerted by the ball on the hand of the player is:

(1) 150 N

(2) 3 N

(3) 30 N

(4) 300 N

15. A voltage drop of 2V occurs across a light emitting diode (LED) and a current of 10 μA is passed through it when it is operated with a 6 V battery having a limiting resistor R. What is the value of R?

(1) 300 $k\Omega$

(2) 350 $k\Omega$

(3) 400 $k\Omega$

(4) 450 $k\Omega$

16. The coil of choke in a circuit

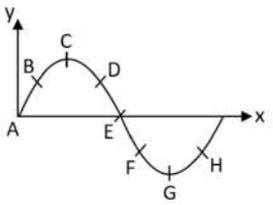
(1) Increases the current

(2) Decreases the current

(3) Does not change the current

(4) Has high resistance to dc circuit

13. एक अनुप्रस्थ तरंग एक तार के अनुदिश बाएं से दाएं की ओर यात्रा कर रही है। नीचे दिया गया चित्र किसी दिए गए क्षण पर तार के आकार को दर्शाता है। इस क्षण पर, बिंदु का ऊपर की ओर वेग है (यहाँ X-तरंग विस्थापन, Y-कण विस्थापन)



(1) D, E, F

(2) A, B, H

(3) B, D, F

(4) A, E, H

14. 20 मी./से. की चाल से गतिमान 150 ग्राम द्रव्यमान की एक गेंद को एक खिलाड़ी पकड़ता है। यदि पकड़ने में 0.1 सेकंड का समय लगा तब खिलाड़ी के हाथ पर गेंद द्वारा लगाये गये बल का परिमाण है :

(1) 150 N

(2) 3 N

(3) 30 N

(4) 300 N

15. एक प्रकाश उत्सर्जक डायोड (एलईडी) पर 2V का वोल्टेज गिरता है और 10 μA की धारा इसके माध्यम से प्रवाहित होती है जब इसे सीमित अवरोधक R वाली 6 V बैटरी से संचालित किया जाता है। R का मान क्या है?

(1) 300 $k\Omega$

(2) 350 $k\Omega$

(3) 400 $k\Omega$

(4) 450 $k\Omega$

16. एक परिपथ में चोक की कुंडली

(1) धारा को बढ़ाती है

(2) धारा कम करती है

(3) धारा को परिवर्तित नहीं करती है

(4) डीसी परिपथ के लिए उच्च प्रतिरोध है

17. The two coherent sources with intensity ratio β produce interference. The fringe visibility will be -

(1) $\frac{2\sqrt{\beta}}{1+\beta}$

(2) 2β

(3) $\frac{2}{1+\beta}$

(4) $\frac{\sqrt{\beta}}{1+\beta}$

18. A sine wave is travelling in a medium. The minimum distance between the two particles, always having same speed, is

(1) $\frac{\lambda}{4}$

(2) $\frac{\lambda}{3}$

(3) $\frac{\lambda}{2}$

(4) λ

19. A block of mass m slides down the plane inclined at angle 30° with an acceleration $\frac{g}{4}$. The value of coefficient of kinetic friction will be :

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

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

(3) $\frac{\sqrt{3}}{2}$

(4) $\frac{2\sqrt{3}-1}{2}$

20. Consider earth to be a homogeneous sphere. Scientist A goes deep down in a mine and scientist B goes high up in a balloon. The value of g measured by

(1) A goes on decreasing and that by B goes on increasing

(2) B goes on decreasing and that by A goes on increasing

(3) Each decreases at the same rate

(4) Each decreases at different rates

21. A particle of mass 1 mg has the same wavelength as an electron moving with a velocity of 3×10^6 ms^{-1}. What is the velocity of the particle?

(1) 7.2×10^{-18} ms^{-1}

(2) 2.7×10^{-18} ms^{-1}

(3) 7.2×10^{18} ms^{-1}

(4) 2.7×10^{18} ms^{-1}

17. दो कला सम्बद्ध स्त्रोत जिनकी तीव्रताओं का अनुपात β है, व्यतिकरण करते हैं। फ्रिन्ज दृश्यता होगी -

(1) $\frac{2\sqrt{\beta}}{1+\beta}$

(2) 2β

(3) $\frac{2}{1+\beta}$

(4) $\frac{\sqrt{\beta}}{1+\beta}$

18. एक ज्या तरंग एक माध्यम में यात्रा कर रही है। सदैव समान गति वाले दो कणों के बीच न्यूनतम दूरी होती है।

(1) $\frac{\lambda}{4}$

(2) $\frac{\lambda}{3}$

(3) $\frac{\lambda}{2}$

(4) λ

19. m द्रव्यमान का एक गुटका 30° कोण के नत समतल पर $\frac{g}{4}$ त्वरण से फिसलता है। गतिज घर्षण गुणांक का मान होगा :

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

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

(3) $\frac{\sqrt{3}}{2}$

(4) $\frac{2\sqrt{3}-1}{2}$

20. पृथ्वी को एक समरूप गोला मान लें। वैज्ञानिक A खदान में गहराई तक जाता है और वैज्ञानिक B गुब्बारे में ऊपर जाता है। g का मान

(1) A द्वारा मापने पर घटता जाता है और B द्वारा मापने पर बढ़ता जाता है

(2) B द्वारा मापने पर घटता जाता है और A द्वारा मापने पर बढ़ता जाता है

(3) दोनों एक ही दर से घटते हैं

(4) प्रत्येक भिन्न दर पर घटता है

21. 1 mg द्रव्यमान के एक कण की तरंगदैर्ध्य, 3×10^6 ms^{-1} वेग से गतिमान इलेक्ट्रॉन की तरंगदैर्ध्य के समान है। कण का वेग क्या है?

(1) 7.2×10^{-18} ms^{-1}

(2) 2.7×10^{-18} ms^{-1}

(3) 7.2×10^{18} ms^{-1}

(4) 2.7×10^{18} ms^{-1}

22. Two lens of focal length -20cm and +10cm are put in combination, find the power of the combination:

(1) –1D

(2) –2D

(3) +5D

(4) +2D

23. A solid sphere and solid cylidner of identical radii approach an incline with the same linear velocity (see figure). Both roll without slipping all throughout. The two climb maximum heights h_{sph} and h_{cyl} on the incline. The ratio $\frac{h_{sph}}{h_{cy}}$ is given by

(1) $\frac{2}{\sqrt{5}}$

(2) $\frac{14}{15}$

(3) 1

(4) $\frac{4}{5}$

24. The initial speed of a projectile fired from ground is u. At the highest point during its motion, the speed of projectile is $\frac{\sqrt{3}}{2}u$. The time of flight of the projectile is:

(1) $\frac{u}{2g}$

(2) $\frac{u}{g}$

(3) $\frac{2u}{g}$

(4) $\frac{\sqrt{3}u}{g}$

25. An electron beam has an aparture of 2 mm^2. A total of 7×10^{16} electrons flow through any perpendicular cross-section per second. Calculate the current density in the eletron beam.

(1) $5.6 \times 10^3\ Am^{-2}$

(2) $6.5 \times 10^3\ Am^{-2}$

(3) $5.6 \times 10^{-3}\ Am^{-2}$

(4) $6.5 \times 10^{-3}\ Am^{-2}$

22. दो लेंस जिनकी फोकस दूरी –20cm व +10cm हैं, को मिलाकर एक संयोजन बनाया जाता है। इस संयोजन की शक्ति होगी :

(1) –1D

(2) –2D

(3) +5D

(4) +2D

23. समान त्रिज्या वाला एक ठोस गोला और ठोस बेलन एक ही रैखिक वेग से ढलान की ओर बढ़ते हैं (चित्र देखें)। दोनों बिना फिसले पूरी तरह लुढ़कते हैं। दोनों ढलान पर अधिकतम ऊंचाइयों h_{sph} और h_{cyl} पर चढ़ते हैं। $\frac{h_{sph}}{h_{cy}}$ का अनुपात इस प्रकार दिया गया है

(1) $\frac{2}{\sqrt{5}}$

(2) $\frac{14}{15}$

(3) 1

(4) $\frac{4}{5}$

24. धरातल से दागे (छोडे) गए एक प्रक्षेप की प्रारम्भिक चाल u है। गति के दौरान अधिकतम ऊँचाई पर प्रक्षेप की चाल $\frac{\sqrt{3}}{2}u$ है । प्रक्षेप का उड्डयन काल है–

(1) $\frac{u}{2g}$

(2) $\frac{u}{g}$

(3) $\frac{2u}{g}$

(4) $\frac{\sqrt{3}u}{g}$

25. एक इलेक्ट्रॉन किरण का द्वारक 2 mm^2 है। प्रति सेकंड किसी भी लंबवत अनुप्रस्थ काट से कुल 7×10^{16} इलेक्ट्रॉन प्रवाहित होते हैं। इलेक्ट्रॉन किरण में धारा घनत्व की गणना करें।

(1) $5.6 \times 10^3\ Am^{-2}$

(2) $6.5 \times 10^3\ Am^{-2}$

(3) $5.6 \times 10^{-3}\ Am^{-2}$

(4) $6.5 \times 10^{-3}\ Am^{-2}$

26. Consider the binding energy of $_{17}Cl^{35}$ and $_{15}P^{31}$ are 287.67 MeV and 262.48 MeV, respectively. Then,

(1) $_{17}Cl^{35}$ is more stable than $_{15}P^{31}$

(2) $_{15}P^{31}$ is more stable than $_{17}Cl^{35}$

(3) stability of both the elements is equivalent

(4) cannot be estimated from the given data

27. A ray of light propagates from glass (refractive index = 3/2) to water (refractive index = 4/3). The value of the critical angle

(1) $\sin^{-1}(1/2)$

(2) $\sin^{-1}\left(\frac{\sqrt{8}}{9}\right)$

(3) $\sin^{-1}(8/9)$

(4) $\sin^{-1}(5/7)$

28. A particle performs uniform circular motion with an angular momentum L. If the frequency of particle's motion is doubled and its kinetic energy halved, the angualr momentum becomes -

(1) 2L

(2) 4L

(3) L/2

(4) L/4

29. The applied input AC to a half wave rectifier is 60 W and the DC output is 20 W. Find the rectification efficiency.

(1) 33.3 %

(2) 30.3 %

(3) 35.3 %

(4) 38.5 %

30. Which of the following statement is incorrect about electromagnetic waves?

(1) EM waves are produced by accelerating charges.

(2) EM waves do not transport charge.

(3) Energy of the EM waves is shared equally between the electric and magnetic fields.

(4) EM waves travel with the same speed in all media.

26. $_{17}Cl^{35}$ और $_{15}P^{31}$ की बंधन ऊर्जा क्रमशः 287.67 MeV और 262.48 MeV है। तो,

(1) $_{17}Cl^{35}$,$_{15}P^{31}$ से अधिक स्थायी है

(2) $_{15}P^{31}$,$_{17}Cl^{35}$ से अधिक स्थायी है

(3) दोनों तत्वों के स्थायित्व बराबर है

(4) दिए गए आंकड़ों से अनुमान नहीं लगाया जा सकता

27. प्रकाश की एक किरण कांच (अपवर्तनांक = 3/2) से पानी (अपवर्तनांक = 4/3) तक गमन करती है। क्रान्तिक कोण का मान है

(1) $\sin^{-1}(1/2)$

(2) $\sin^{-1}\left(\frac{\sqrt{8}}{9}\right)$

(3) $\sin^{-1}(8/9)$

(4) $\sin^{-1}(5/7)$

28. एक कण कोणीय संवेग L से एक समान वृत्तीय गति प्रदर्शित करता है। यदि कण के गति की आवृत्ति दुगुनी तथा इसकी गतिज ऊर्जा आधी कर दे , तब कोणीय संवेग होगा-

(1) 2L

(2) 4L

(3) L/2

(4) L/4

29. अर्ध तरंग दिष्टकारी में प्रयुक्त निवेशी AC, 60 W है तथा DC निर्गत 20 W है। परिशोधन दक्षता ज्ञात करें।

(1) 33.3 %

(2) 30.3 %

(3) 35.3 %

(4) 38.5 %

30. इनमें से कौनसा कथन विद्युत चुम्बकीय तंरगो के लिये गलत है।

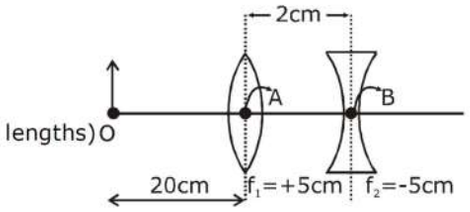
(1) विद्युत चुम्बकीय तरंगे त्वरित आवेश के द्वारा उत्पन्न की जाती है।

(2) विद्युत चुम्बकीय तरंग आवेश स्थानान्तरित नही करती।

(3) विद्युत चुम्बकीय तरंग की ऊर्जा समान रूप से विद्युत क्षेत्र तथा चुम्बकीय क्षेत्र में वितरित की जाती है।

(4) विद्युत चुम्बकीय तरंगे सभी माध्यम में समान चाल से गति करती है।

31. What is the position and nature of image formed by lens combination shown in figure? (f_1, f_2 are focal lengths)



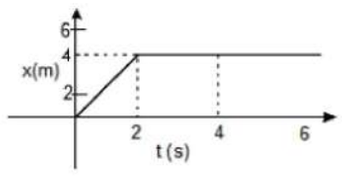
(1) 40 cm from point B at right ; real

(2) $\frac{20}{3}$ cm from point B at right ; real

(3) 70 cm from point B at right ; real

(4) 70 cm from point B at left ; virtual

32. In the figure given the position-time graph of a particle of mass 0.1 kg is shown. The impulse at t = 2 s is:



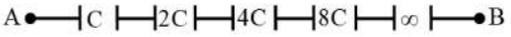
(1) 0.2 kg m s^{-1}

(2) – 0.2 kg m s^{-1}

(3) 0.1 kg m s^{-1}

(4) – 0.4 kg m s^{-1}

33. The equivalent capacitance between A and B will be -



(1) 2 C

(2) $\frac{C}{2}$

(3) 3 C

(4) $\frac{2}{C}$

34. A proton, a neutron, an electron and an α-particle have same energy, then their de-Broglie wavelengths compare as-

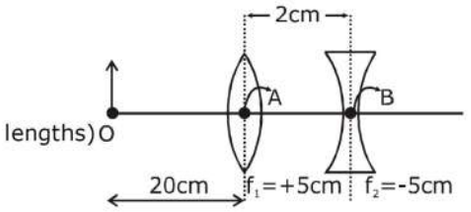
(1) $\lambda_p = \lambda_n > \lambda_e > \lambda_\alpha$

(2) $\lambda_\alpha < \lambda_n < \lambda_p < \lambda_e$

(3) $\lambda_e < \lambda_p = \lambda_n > \lambda_\alpha$

(4) $\lambda_e = \lambda_p = \lambda_n = \lambda_\alpha$

31. दिये गये चित्र में लैन्स संयोजन से बने प्रतिबिम्ब की स्थिति व प्रकृति होगी ?(f_1, f_2 फोकस दूरियाँ है।)



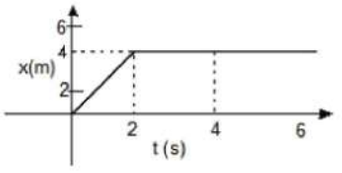
(1) बिन्दु B से 40 cm दांयी ओर ; वास्तविक

(2) बिन्दु B से $\frac{20}{3}$cm दांयी ओर; वास्तविक

(3) बिन्दु B से 70 cm दांयी ओर ; वास्तविक

(4) बिन्दु B से 70 cm बॉयी ओर; आभासी

32. दिए गए चित्र में 0.1 kg द्रव्यमान के एक कण का स्थिति-समय ग्राफ दिखाया गया है। t = 2 s पर आवेग है:



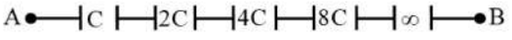
(1) 0.2 kg m s^{-1}

(2) – 0.2 kg m s^{-1}

(3) 0.1 kg m s^{-1}

(4) – 0.4 kg m s^{-1}

33. A और B के बीच तुल्य धारिता होगी -



(1) 2 C

(2) $\frac{C}{2}$

(3) 3 C

(4) $\frac{2}{C}$

34. एक प्रोटॉन, एक न्यूट्रॉन, एक इलेक्ट्रॉन और एक α -कण की ऊर्जा समान होती है, तो उनकी डे-ब्रॉग्ली तरंगदैर्ध्य की तुलना इस प्रकार की जाती है

(1) $\lambda_p = \lambda_n > \lambda_e > \lambda_\alpha$

(2) $\lambda_\alpha < \lambda_n < \lambda_p < \lambda_e$

(3) $\lambda_e < \lambda_p = \lambda_n > \lambda_\alpha$

(4) $\lambda_e = \lambda_p = \lambda_n = \lambda_\alpha$

35. At two points P and Q on screen in Young's double slit experiment, waves from slits S_1 and S_2 have a path difference of 0 and $\frac{\lambda}{4}$ respectively. The ratio of intensities at P and Q will be

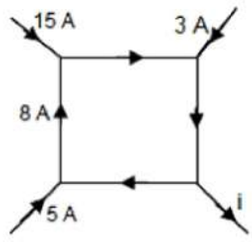
(1) 3:2

(2) 2:1

(3) $\sqrt{2}:1$

(4) 4:1

36. The figure shows a network of currents. The current i will be



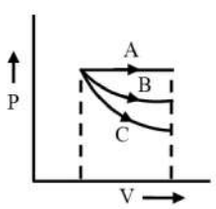
(1) 3 A

(2) 13 A

(3) 23 A

(4) –3 A

37. During isothermal, isobaric and adiabatic processes, work done for same change in volume will be maximum for-



(1) Isothermal

(2) Isobaric

(3) Adiabatic

(4) None of the above

35. यंग के द्वि-झिरी प्रयोग में, S_1 तथा S_2 झिरी से आने वाली तरंगों के बीच दो बिन्दु P एवं Q पर पथान्तर क्रमशः शून्य एवं $\frac{\lambda}{4}$ है। P एवं Q पर तीव्रताओं का अनुपात होगा-

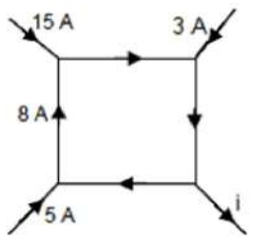
(1) 3:2

(2) 2:1

(3) $\sqrt{2}:1$

(4) 4:1

36. चित्र धाराओ के एक नेटवर्क को दर्शाता है | तब धारा i होगी



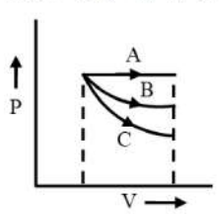
(1) 3 A

(2) 13 A

(3) 23 A

(4) –3 A

37. समतापी, समदाबीय और रुद्धोष्म प्रक्रम के दौरान, आयतन में समान परिवर्तन के लिए किया गया कार्य ....के लिए अधिकतम होगा-



(1) समतापीय

(2) समदाबीय

(3) रूद्धोष्म

(4) इनमे से कोई भी नहीं

38. **Assertion:** According to law of conservation of mechanical energy, change in potential energy is equal and negative to the change in kinetic energy.
Reason : Mechanical energy is not a conserved quantity.

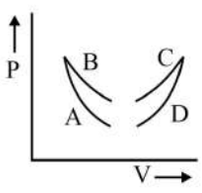
(1) Both (Assertion) and (Reason) are correct and (Reason) is not the correct explanation of (Assertion).

(2) (Assertion) is correct but (Reason) is not correct.

(3) (Assertion) is not correct but (Reason) is correct.

(4) Both (Assertion) and (Reason) are correct and (Reason) is the correct explanation of (Assertion).

39. Reference of given figure, no heat exchange between the gas and the surrounding will take place if the gas is taken along



(1) curve A

(2) curve B

(3) curve C

(4) curve D

40. Two springs have their force constant as k_1 and k_2 ($k_1 > k_2$). When they are stretched by the same force

(1) No work is done by this force in case of both the springs

(2) Equal work is done by this force in case of both the springs

(3) More work is done by this force in case of second spring

(4) More work is done by this force in case of first spring

41. A piece of wire of resistance 4Ω is bent through 180° at its midpoint and the two halves are twisted together. The new resistance will be

(1) 8Ω

(2) 4Ω

(3) 6Ω

(4) 1Ω

38. **कथन:** यांत्रिक ऊर्जा के संरक्षण के नियम के अनुसार, स्थितिज ऊर्जा में परिवर्तन समान तथा गतिज ऊर्जा में परिवर्तन से ऋणात्मक होता है।
कारण: यांत्रिक ऊर्जा एक संरक्षित राशि नहीं है।

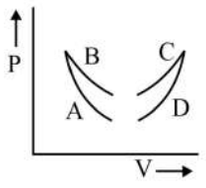
(1) कथन तथा कारण दोनों सही है तथा कारण, कथन का सही स्पष्टीकरण नहीं है।

(2) कथन सही है परन्तु कारण सही नही है।

(3) कथन सही नहीं है परन्तु कारण सही है।

(4) कथन तथा कारण दोनों सही है तथा कारण, कथन का सही स्पष्टीकरण है।

39. दिए गए चित्र के सन्दर्भ में गैस और वातावरण के बीच ऊष्मा का स्थानान्तरण नहीं होगा यदि गैस निम्न के अनुदिश ली जाती है



(1) वक्र A

(2) वक्र B

(3) वक्र C

(4) वक्र D

40. दो स्प्रिंगों का बल स्थिरांक k_1 और k_2 ($k_1 > k_2$) है। जब उन्हें समान बल से खींचा जाता है

(1) दोनों स्प्रिंग्स की स्थिति में इस बल द्वारा कोई कार्य नहीं किया जाता है

(2) दोनों स्प्रिंग्स की स्थिति में इस बल द्वारा समान कार्य किया जाता है

(3) दूसरे स्प्रिंग की स्थिति में इस बल द्वारा अधिक कार्य किया जाता है

(4) प्रथम स्प्रिंग की स्थिति में इस बल द्वारा अधिक कार्य किया जाता है

41. 4Ω प्रतिरोध वाले तार के टुकड़े को उसके मध्य बिंदु पर $180°$ से मोड़ा गया है तथा दोनों अर्ध भागों को एक साथ मोड़ दिया गया है। नया प्रतिरोध होगा

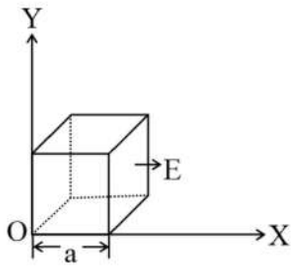
(1) 8Ω

(2) 4Ω

(3) 6Ω

(4) 1Ω

42. The electric field in a region shown here is given by $\vec{E} = E_0 x^{3/2} \hat{i}$ volt/m. Then, the total electric flux through the cube of side a is



(1) $E_0 a^{7/5}$

(2) $E_0 a^{2/5}$

(3) $E_0 a^{2/7}$

(4) $E_0 a^{7/2}$

43. Calculate the percentage error in the volume of a cube if the error in measurement of it's each side is 2%

(1) 3×6%

(2) 3×2%

(3) 4×2%

(4) None

44. A compound microscope has an objective and an eye piece of focal lengths 4 cm and 10 cm respectively. When an object is kept at a distance of 5 cm from the objective then final image is formed at the least distance of distinct vision , magnification of the microscope is:-

(1) 10

(2) 12

(3) 13

(4) 14

45. Dimensions of sin θ is

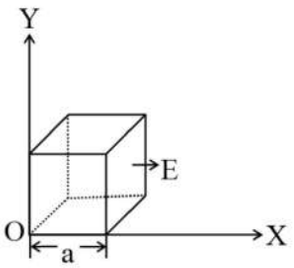
(1) $[L^2]$

(2) [M]

(3) [ML]

(4) $[M^0 L^0 T^0]$

42. यहाँ दर्शाए गए क्षेत्र में विद्युत क्षेत्र $\vec{E} = E_0 x^{3/2} \hat{i}$ वोल्ट/मी द्वारा दिया गया है। तब, भुजा a वाले घन से होकर जाने वाला कुल विद्युत फ्लक्स है



(1) $E_0 a^{7/5}$

(2) $E_0 a^{2/5}$

(3) $E_0 a^{2/7}$

(4) $E_0 a^{7/2}$

43. एक घन के आयतन में प्रतिशत त्रुटि की गणना करें यदि इसकी प्रत्येक भुजा के माप में त्रुटि 2% है

(1) 3×6%

(2) 3×2%

(3) 4×2%

(4) कोई नही

44. एक संयुक्त सूक्ष्मदर्शी केअभिदृश्यक एवं अभिनेत्र लैंस की फोकस दूरी क्रमशः 4 सेमी एवं 10 सेमी है। जब वस्तु को अभिदृश्यक लैंस से 5 सेमी की दूरी पर रखा जाता है तो अन्तिम प्रतिबिम्ब स्पष्ट दृष्टि की न्यूनतम दूरी पर बनता है, तो सूक्ष्मदर्शी का आवर्धन है:-

(1) 10

(2) 12

(3) 13

(4) 14

45. sin θ की विमायें है

(1) $[L^2]$

(2) [M]

(3) [ML]

(4) $[M^0 L^0 T^0]$

46. Cupric metaborate is –

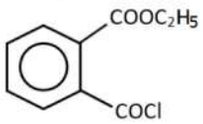
(1) $Cu(BO_3)_2$

(2) Cu_3BO_3

(3) $Cu(BO_2)_2$

(4) Cu_3B_2

47. The IUPAC name of the following compound is



(1) 2-(Ethoxy-carbonyl) benzoyl chloride

(2) Ethyl 2-(Chloro-formyl) benzoate

(3) Ethyl 2-(Chloro-carbonyl) benzene-carboxylate

(4) Ethyl 2-(Chloro-carbonyl) benzoate

48. Which of the following is dependent on temperature ?

(1) Molality

(2) Molarity

(3) Mole fraction

(4) Weight percentage

49. A gas expands from 2 L to 6 L against a constant pressure of 0.5 atm on absorbing 200 J of heat. Calculate the change in internal energy-

(1) 3.7 J

(2) 4.2 J

(3) 4.4 J

(4) –2.6 J

50. What weight of solute (molecular weight = 60) is required to dissolve in 180 g of water to reduce the vapour pressure to $\frac{4^{th}}{5}$ of pure water?

(1) 48 g

(2) 96 g

(3) 150 g

(4) 175 g

46. क्यूप्रिक मेटाबोरेट है

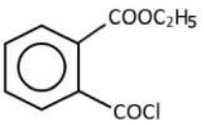
(1) $Cu(BO_3)_2$

(2) Cu_3BO_3

(3) $Cu(BO_2)_2$

(4) Cu_3B_2

47. निम्न यौगिक का IUPAC नाम है



(1) 2-(ऐथॉक्सी-कार्बोनिल) बेन्जोयल क्लोराइड

(2) ऐथिल 2-(क्लोरो-फॉर्मायल) बेन्जोएट

(3) ऐथिल 2-(क्लोरो-कार्बोनिल) बेन्जीन-कार्बोक्सिलेट

(4) ऐथिल 2-(क्लोरो-कार्बोनिल) बेन्जोएट

48. निम्न में से कौन ताप पर निर्भर है ?

(1) मोललता

(2) मोलरता

(3) मोल भिन्न

(4) भार प्रतिशत

49. 200 J ऊष्मा अवशोषित करने पर एक गैस एक नियत दाब 0.5 atm के विरूद्ध 2 L से 6 L तक प्रसारित होती हैं आन्तरिक उर्जा में परिवर्तन की गणना कीजिए -

(1) 3.7 J

(2) 4.2 J

(3) 4.4 J

(4) –2.6 J

50. शुद्ध जल के वाष्पदाब को $\frac{4}{5}$ तक कम करने के लिये 180 g जल में विलेय (अणुभार = 60) के कितने भार को घोलने की आवश्यकता होती है

(1) 48 g

(2) 96 g

(3) 150 g

(4) 175 g

51. Which one is the wrong statement ?

(1) de-Broglie's wavelength is given by $\lambda = \frac{h}{mv}$; where m = mass of the particle, v = group velocity of the particle.

(2) The uncertainty principle is $\Delta E \times \Delta t \geq \frac{h}{4\pi}$

(3) Half filled and fully filled orbitals have greater stability due to greater exchange energy, greater symmetry and more balanced arrangement.

(4) The energy of $2s$ orbital is less than the energy of $2p$ orbital in case of Hydrogen like atoms.

52. The bond energies of C–C, C=C, H–H and C–H linkages are 350, 600, 400 and 410 kJ/mol, respectively. The heat of hydrogenation of ethylene is

(1) –170 $kJmol^{-1}$

(2) –260 $kJmol^{-1}$

(3) –400 $kJmol^{-1}$

(4) 450 $kJmol^{-1}$

53. A solution of 1.25 g of a non-electrolyte in 20 g of water freezes at 271.94 K. If $K_f = 1.86\ K$ molality^{-1} then the molecular wt. of the solute is :

(1) 207.8 g/mol

(2) 179.79 g/mol

(3) 209.6 g/mol

(4) 109.6 g/mol

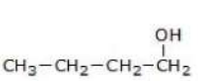
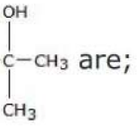
54. Which of the following will not be hydrolyse in normal conditions ?

(1) $SiCl_4$

(2) CCl_4

(3) $BeCl_2.xH_2O$

(4) None

55.  and  are;

(1) chain isomers

(2) positional isomers

(3) both

(4) none

51. निम्न में से कौन सा कथन गलत है ?

(1) डी-ब्रोगली तंरगदैर्ध्य है $\lambda = \frac{h}{mv}$; जहाँ m= कण का द्रव्यमान, v= कण का समूह वेग।

(2) अनिश्चितता सिद्धान्त के अनुसार $\Delta E \times \Delta t \geq \frac{h}{4\pi}$

(3) अर्द्धपूरित एवं पूर्ण पूरित कक्षकों का उच्च स्थायित्व उच्च विनिमय ऊर्जा, उच्च सममिति औरअधिक संतुलित व्यवस्था के कारण है।

(4) हाइड्रोजन जैसे परमाणुओं के लिये $2s$ कक्षक की ऊर्जा $2p$ कक्षक की ऊर्जा से कम होती है।

52. C–C, C=C, H–H तथा C–H बंध की बंध ऊर्जाओ के मान क्रमशः 350, 600, 400 तथा 410 kJ/mol है एथिलीन की हाइड्रोजनीकरण ऊष्मा का मान है

(1) –170 $kJmol^{-1}$

(2) –260 $kJmol^{-1}$

(3) –400 $kJmol^{-1}$

(4) 450 $kJmol^{-1}$

53. 1.25 g विद्युत अनअपघट्य का 20 g जल में विलयन 271.94 K पर जमता है | यदि $K_f = 1.86\ K$ मोललता$^{-1}$ तो विलेय का अणुभार है -

(1) 207.8 g/mol

(2) 179.79 g/mol

(3) 209.6 g/mol

(4) 109.6 g/mol

54. निम्न मे से कौनसा सामान्य परिस्थितियों मे जल अपघटित नही होगा

(1) $SiCl_4$

(2) CCl_4

(3) $BeCl_2.xH_2O$

(4) कोई नही

55. तथा है ;

(1) श्रृंखला समावयवी

(2) स्थिति समावयवी

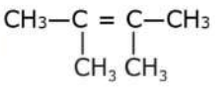
(3) दोनों

(4) कोई नहीं

56. Carbon-carbon double bond length will be maximum in which of the following compounds?

(1) $CH_3-CH=CH_2$

(2) $CH_3-CH=CH-CH_3$

(3) 

(4) $CH_2=CH_2$

57. For the redox reaction,

$MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+} + CO_2 + H_2O$ the correct coefficients of the reactants for the balanced reaction are

(1) $MnO_4^- \rightarrow 2,\ C_2O_4^- \rightarrow 16,\ H^+ \rightarrow 5$

(2) $MnO_4^- \rightarrow 2,\ C_2O_4^- \rightarrow 5,\ H^+ \rightarrow 16$

(3) $MnO_4^- \rightarrow 16,\ C_2O_4^- \rightarrow 5,\ H^+ \rightarrow 2$

(4) $MnO_4^- \rightarrow 5,\ C_2O_4^- \rightarrow 16,\ H^+ \rightarrow 2$

58. In a first order reaction the concentration of reactant decreases from 800 mol/dm^3 to 50 mol/dm^3 in 200 sec.. The rate constant of reaction in s^{-1} is

(1) $2 \times 10^{-4}\ s^{-1}$

(2) $1.386 \times 10^{-2}\ s^{-1}$

(3) $3.45 \times 10^{5}\ s^{-1}$

(4) $2 \times 10^{4}\ s^{-1}$

59. 1.1 g of $CoCl_3.6NH_3$ (mol. wt. = 267) was dissolved in 100 g of H_2O. The freezing point of the solution was –0.3°C. How many moles of solute particles exist in solution for each mole of solute introduced ?
K_f for H_2O = 1.86°C.mol^{-1} :

(1) 4

(2) 2

(3) 3

(4) 5

60. DMG + $NiCl_2 \rightarrow$ Red precipitate to get above precipitate the best pH range is :

(1) < 1

(2) 2–3

(3) 3–4

(4) 9–11

56. निम्न में से कौनसे यौगिकों में कार्बन-कार्बन द्वि-बंध लम्बाई अधिकतम होगी ?

(1) $CH_3-CH=CH_2$

(2) $CH_3-CH=CH-CH_3$

(3)

(4) $CH_2=CH_2$

57. रेडॉक्स अभिक्रिया,

$MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+} + CO_2 + H_2O$ में संतुलित अभिक्रिया के लिए अभिकारकों के गुणांकों की सही संख्या होगी -

(1) $MnO_4^- \rightarrow 2,\ C_2O_4^- \rightarrow 16,\ H^+ \rightarrow 5$

(2) $MnO_4^- \rightarrow 2,\ C_2O_4^- \rightarrow 5,\ H^+ \rightarrow 16$

(3) $MnO_4^- \rightarrow 16,\ C_2O_4^- \rightarrow 5,\ H^+ \rightarrow 2$

(4) $MnO_4^- \rightarrow 5,\ C_2O_4^- \rightarrow 16,\ H^+ \rightarrow 2$

58. एक प्रथम कोटि अभिक्रिया मे क्रियाकारक की सान्द्रता 200 sec में 800 mol/dm^3 से 50 mol/dm^3 तक घट जाती है s^{-1} में अभिक्रिया का दर स्थिरांक होगा

(1) $2 \times 10^{-4}\ s^{-1}$

(2) $1.386 \times 10^{-2}\ s^{-1}$

(3) $3.45 \times 10^{5}\ s^{-1}$

(4) $2 \times 10^{4}\ s^{-1}$

59. $CoCl_3.6NH_3$ (अणुभार = 267) का 1.1g, H_2O के 100g में घोला जाता है। विलयन का हिमांक बिन्दु –0.3°C था। मिलाये गये विलेय के प्रत्येक मोल के लिए विलयन में विलेय कणो के कितने मोल अस्तित्व रखते है ? H_2O के लिए K_f = 1.86°C.mol^{-1}

(1) 4

(2) 2

(3) 3

(4) 5

60. DMG + $NiCl_2 \rightarrow$ लाल अवक्षेप, उपरोक्त अवक्षेप को प्राप्त करने के लिये सर्वश्रेष्ट pH परास है`

(1) < 1

(2) 2–3

(3) 3–4

(4) 9–11

61. Which is not dissolved by dil HCl ?

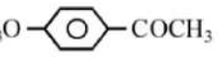
(1) ZnS

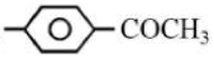
(2) MnS

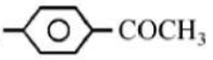
(3) $BaSO_3$

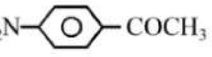
(4) $BaSO_4$

62. Which of the following ketones can not be prepared by Friedel crafts acylation :-

(1) 

(2) 

(3) 

(4) 

63. If the rate of reaction becomes double when temperature is increased from 25°C to 35°C, then activation energy of the reaction (in kJ) will be :

(1) 52.89 kJ

(2) 65.2 kJ

(3) 68.5 kJ

(4) 35.3 kJ

64. **Statement-I :** pH of 10^{-7} M HCl is less than 7 at 25°C.

Statement-II : At very low concentration of HCl, contribution of H^+ from water is considerable.

(1) Both Statement-I and Statement-II are true, and Statement-II is correct explanation of Statement-I.

(2) Both Statement-I and Statement-II are true but Statement-II is not the correct explanation of Statement-I.

(3) Statement-I is true but Statement-II is false.

(4) Statement-I & Statement-II both are false

65. Degree of dissociation of 0.1 N CH_3COOH is :-

(Dissociation constant = 1×10^{-5})

(1) 10^{-5}

(2) 10^{-4}

(3) 10^{-3}

(4) 10^{-2}

61. कौन तनु HCl में नही घुलता है

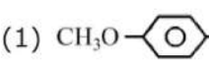
(1) ZnS

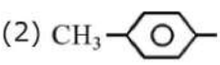
(2) MnS

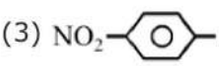
(3) $BaSO_3$

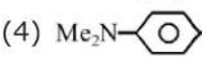
(4) $BaSO_4$

62. निम्न में से कौनसा किटोन फ्रिडेल क्राफ्ट एसाईलीकरण से नहीं बनाया जा सकता है :-

(1) 

(2) 

(3) 

(4) 

63. यदि अभिक्रिया की दर दुगुनी हो जाती है जब ताप 25°C से 35°C तक बढ़ता है तो अभिक्रिया की सक्रियण ऊर्जा (kJ में) होगी

(1) 52.89 kJ

(2) 65.2 kJ

(3) 68.5 kJ

(4) 35.3 kJ

64. **कथन-I :** 25°C पर 10^{-7} M HCl की pH 7 से कम होगी।

कथन-II : HCl की बहुत कम सान्द्रता होने पर जल से H^+ आयन का योगदान महत्वपूर्ण होता है।

(1) दोनो कथन I एवं कथन II सत्य हैं तथा कथन II कथन I की सही व्याख्या है

(2) दोनो कथन I एवं कथन II सत्य हैं तथा कथन II कथन I की सही व्याख्या नही है

(3) कथन I सत्य है, लेकिन कथन II असत्य है

(4) कथन I तथा कथन II दोनो असत्य हैं

65. 0.1 N CH_3COOH के वियोजन की मात्रा होगी

(वियोजन स्थिरांक = 1×10^{-5})

(1) 10^{-5}

(2) 10^{-4}

(3) 10^{-3}

(4) 10^{-2}

66. In which of the following configuration(s) the value of "spin only" magnetic moment is 2.84 BM for octahedral complex :

(I) d^4 (In strong field ligand)
(II) d^3 (In weak field ligand)
(III) d^5 (In strong field ligand)
(IV) d^8 (In weak field ligand)

(1) I, III

(2) II, IV

(3) II, III

(4) I, IV

67. The final product formed when Acetaldehyde is reduced with Sodium and Alcohol is

(1) Ethylene

(2) Ethyl alcohol

(3) Ethene

(4) All of these

68. The standard EMF of a Daniell cell is 1.10 volt. The maximum electrical work obtained from the Daniell cell is

(1) 212.3 kJ

(2) 175.4 kJ

(3) 106.15 kJ

(4) 53.07 kJ

69. The ligands in anticancer drug cisplatin are :-

(1) NH_3, Cl

(2) NH_3, H_2O

(3) Cl, H_2O

(4) NO, Cl

70. Benzaldehyde on reaction with acetophenone in the presence of sodium hydroxide solution and heat gives

(1) $C_6H_5CH = CHCOC_6H_5$

(2) $C_6H_5COCH_2C_6H_5$

(3) $C_6H_5CH = CHC_6H_5$

(4) $C_6H_5CH(OH)COC_6H_5$

66. निम्न मे से कौनसे विन्यास में अष्टफलकीय संकुल के लिये केवल चक्रण चुम्बकीय आघूर्ण का मान 2.84 BM है

(I) d^4 (प्रबल क्षेत्र लिगेंड मे)
(II) d^3 (दुर्बल क्षेत्र लिगेंड मे)
(III) d^5 (प्रबल क्षेत्र लिगेंड मे)
(IV) d^8 (दुर्बल क्षेत्र लिगेंड मे)

(1) I, III

(2) II, IV

(3) II, III

(4) I, IV

67. अन्तिम उत्पाद निर्मित होता है जब ऐसिटेल्डिहाइड को सोडीयम तथा एल्कोहॉल के साथ अपचयित किया जाता है

(1) एथिलीन

(2) ऐथिल एल्कोहॉल

(3) ऐथीन

(4) उपरोक्त सभी

68. एक डेनियल सेल का मानक EMF, 1.10 वोल्ट है। डेनियल सेल से प्राप्त अधिकतम विद्युतीय कार्य होगा

(1) 212.3 kJ

(2) 175.4 kJ

(3) 106.15 kJ

(4) 53.07 kJ

69. कैंसररोधी औषधी सिस प्लेटिन में संलग्नी हैं :-

(1) NH_3, Cl

(2) NH_3, H_2O

(3) Cl, H_2O

(4) NO, Cl

70. बेन्जल्डिहाइड, सोडियम हाइड्रॉक्साइड तथा ऊष्मा की उपस्थिति में एसीटोफिनॉन से क्रिया करके देता है

(1) $C_6H_5CH = CHCOC_6H_5$

(2) $C_6H_5COCH_2C_6H_5$

(3) $C_6H_5CH = CHC_6H_5$

(4) $C_6H_5CH(OH)COC_6H_5$

71. The standard reduction electrode potentials of four elements are

A = – 0.250 V, B = – 0.136 V

C = – 0.126 V, D = – 0.402 V

The metal that displaces A from its aqueous solution is:

(1) B

(2) C

(3) D

(4) None of these

72. Which shows ionisation isomerism :-

(1) $[Pt(NH_3)_2Cl_2]$

(2) $K_4[Fe(CN)_6]$

(3) $[Co(NH_3)_5Br]SO_4$

(4) $[Cr(NH_3)_6]Cl_3$

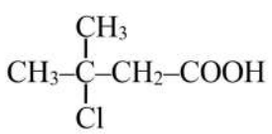
73. Acetamide is treated separately with the following reagents. Which one of these would give methyl amine?

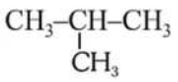
(1) PCl_5

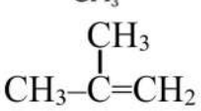
(2) $NaOH + Br_2$

(3) Sodalime

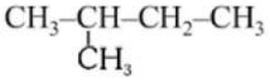
(4) Hot conc. H_2SO_4

74. Decarboxylation of  with soda lime gives:-

(1) 

(2) 

(3) $CH_3-CH_2-CH_3$

(4) 

75. According to Kohlrausch law, the limiting value of molar conductivity of an electrolyte A_2B is

(1) $\lambda^{\infty}_{(A^+)} + \lambda^{\infty}_{(B^{2-})}$

(2) $\lambda^{\infty}_{(A^+)} - \lambda^{\infty}_{(B^{2-})}$

(3) $2\lambda^{\infty}_{(A^+)} + \frac{1}{2}\lambda^{\infty}_{(B^{2-})}$

(4) $2\lambda^{\infty}_{(A^+)} + \lambda^{\infty}_{(B^{2-})}$

71. चार तत्वों के मानक अपचयन इलेक्ट्रोड विभव निम्न है -

A = – 0.250 V, B = – 0.136 V

C = – 0.126 V, D = – 0.402 V

कौनसी धातु इसके जलीय विलयन से A को विस्थापित करेगी

(1) B

(2) C

(3) D

(4) इनमें से कोई नहीं

72. आयनन समावयवता दर्शाता है :

(1) $[Pt(NH_3)_2Cl_2]$

(2) $K_4[Fe(CN)_6]$

(3) $[Co(NH_3)_5Br]SO_4$

(4) $[Cr(NH_3)_6]Cl_3$

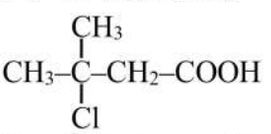
73. एसिटेमाइड की पृथक -पृथक निम्न अभिकर्मकों से उपचारित करते है तो निम्न में से कौनसा मेथिल एमिन देगा ?

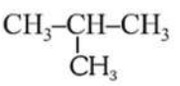
(1) PCl_5

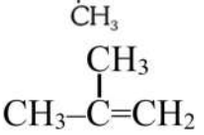
(2) $NaOH + Br_2$

(3) सोडालाइम

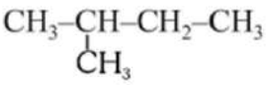
(4) गर्म सान्द्र H_2SO_4

74.  का सोडालाइम के द्वारा विकार्बोक्सिकरण कराने पर बनता है :-

(1) 

(2) 

(3) $CH_3-CH_2-CH_3$

(4) 

75. कोलराऊस नियम के अनुसार एक विद्युत अपघट्य A_2B की मोलर चालकता का सीमान्त मान है

(1) $\lambda^{\infty}_{(A^+)} + \lambda^{\infty}_{(B^{2-})}$

(2) $\lambda^{\infty}_{(A^+)} - \lambda^{\infty}_{(B^{2-})}$

(3) $2\lambda^{\infty}_{(A^+)} + \frac{1}{2}\lambda^{\infty}_{(B^{2-})}$

(4) $2\lambda^{\infty}_{(A^+)} + \lambda^{\infty}_{(B^{2-})}$

76. **Assertion :** N_2^+ is more stable than N_2^-

Reason : N_2^+ has less electrons in antibonding orbitals.

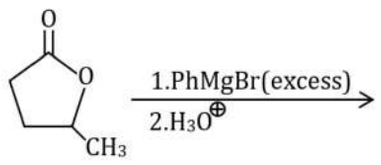
(1) If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.

(2) If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.

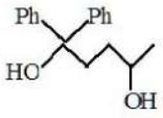
(3) If Assertion is True but the Reason is False.

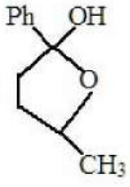
(4) If both Assertion & Reason are False.

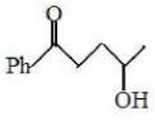
77.

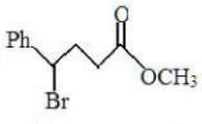


The major product formed in the reaction is :

(1) 

(2) 

(3) 

(4) 

78. According to Le–Chatelier's principal adding heat to a solid and liquid in equilibrium with endothermic nature will cause the

(1) Temperature to rise

(2) Temperature to fall

(3) Amount of solid to decrease

(4) Amount of liquid to decrease

76. **कथन :** N_2^+, N_2^- से अधिक स्थायी है

कारण : N_2^+ प्रतिआबंधी कक्षको मे कम इलेक्ट्रॉन रखता है

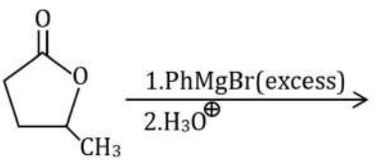
(1) यदि दोनो कथन तथा कारण सही है तथा कारण कथन की सही व्याख्या है

(2) यदि दोनो कथन तथा कारण सही है तथा कारण कथन की सही व्याख्या नही है

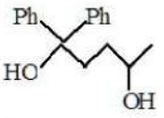
(3) यदि कथन सही है परन्तू कारण गलत है

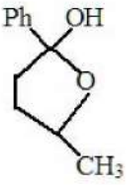
(4) यदि दोनो कथन तथा कारण गलत है

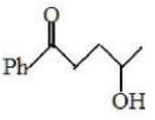
77.

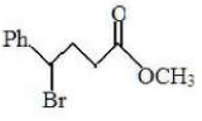


अभिक्रिया में बनने वाला प्रमुख उत्पाद है

(1) 

(2) 

(3) 

(4) 

78. ली-शातेलिये सिद्धान्त के अनुसार ऊष्माशोषी प्रकृति वाले साम्य में एक ठोस तथा द्रव को ऊष्मा देने पर

(1) ताप बढ़ जाता है

(2) ताप घट जाता है

(3) ठोस की मात्रा घटती है

(4) द्रव की मात्रा घटती है

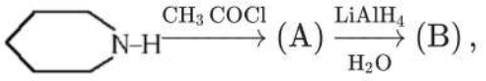
79. Assuming 2s-2p mixing is NOT operative, the diamagnetic species among the following is

(1) B_2

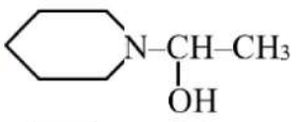
(2) C_2

(3) N_2^{2+}

(4) N_2^+

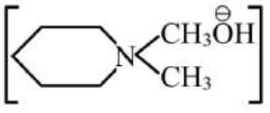
80. 

B is :-

(1) 

(2) 

(3) 

(4) 

81. Match List-I with List-II.

	List-I (Molecules)		**List-II (Correct observation Considering Molecular Orbital Theory)**
(P)	O_2	(a)	Maximum unpaired electron
(Q)	N_2	(b)	No multiple bond
(R)	F_2	(c)	Odd electron species
(S)	O_2^+	(d)	s-p mixing

Select correct code :

(1)

P	Q	R	S
d	a	c	b

(2)

P	Q	R	S
a	d	b	c

(3)

P	Q	R	S
a	d	c	b

(4)

P	Q	R	S
c	d	b	a

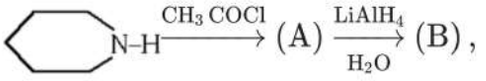
79. यह मानते हुए कि 2s-2p मिश्रण सक्रिय नहीं है, निम्नलिखित में से प्रतिचुंबकीय स्पीशीज़ है

(1) B_2

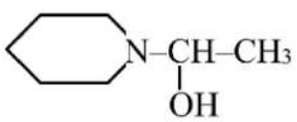
(2) C_2

(3) N_2^{2+}

(4) N_2^+

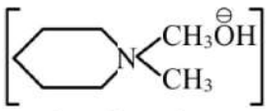
80. 

B है :-

(1) 

(2) 

(3) 

(4) 

81. **सूची-I** को **सूची-II** के साथ सुमेलित कीजिये

	सूची-I (अणु)		**सूची-II (आण्विक कक्षक सिद्धान्त को ध्यान मे रखते हुये सही प्रेक्षण)**
(P)	O_2	(a)	अधिकतम अयुग्मित इलेक्ट्रॉन
(Q)	N_2	(b)	कोई बहुबन्ध नही
(R)	F_2	(c)	विषम इलेक्ट्रॉन प्रजाति
(S)	O_2^+	(d)	s-p मिश्रण

सही कोड का चयन कीजिये

(1)

P	Q	R	S
d	a	c	b

(2)

P	Q	R	S
a	d	b	c

(3)

P	Q	R	S
a	d	c	b

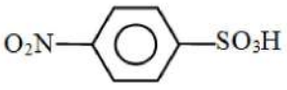
(4)

P	Q	R	S
c	d	b	a

82. Which of the following will give blood red color in lassaigne's test for nitrogen

(1) $PhNH_2$

(2) $PhNO_2$

(3) 

(4) $PhSO_3H$

83. In $TeCl_4$, the central atom tellurium involves

(1) sp^3 hybridisation

(2) sp^3d hybridization

(3) sp^3d^2 hybridisation

(4) dsp^2 hybridisation

84. Minimum bond angle is associated with ?

(1) H_2S

(2) H_2O

(3) NH_3

(4) CH_4

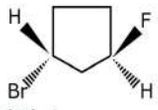
85. Consider the following statements about vitamin 'E' and select the incorrect statement(s).

(1) It is water soluble vitamin

(2) It is present in sunflower oil, wheat germ oil etc.

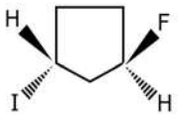
(3) It is stored in liver

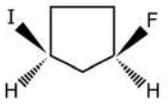
(4) Its deficiency increases the muscular weakness

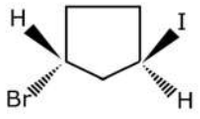
86.  $\xrightarrow[\text{acetone}]{\text{NaI(one mole)}}$ Major Product

(P) is :

(1) 

(2) 

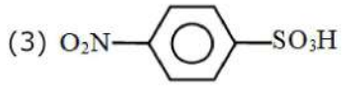
(3) 

(4) 

82. निम्न में से कौनसा नाइट्रोजन के लिये लासैने परिक्षण में रक्त जैसा लाल रंग देगा?

(1) $PhNH_2$

(2) $PhNO_2$

(3) 

(4) $PhSO_3H$

83. $TeCl_4$ में केन्द्रीय परमाणु टेल्युरियम का संकरण है

(1) sp^3 संकरण

(2) sp^3d संकरण

(3) sp^3d^2 संकरण

(4) dsp^2 संकरण

84. न्यूनतम बन्ध कोण है

(1) H_2S

(2) H_2O

(3) NH_3

(4) CH_4

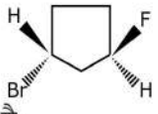
85. विटामिन 'E' के सन्दर्भ मे निम्न कथनो पर विचार कीजिये तथा गलत कथन का चयन कीजिये

(1) यह जल विलेय विटामिन है

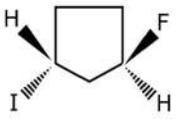
(2) यह सूरजमुखी तेल गेहू बीज तेल आदि मे उपस्थित है

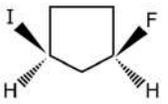
(3) यह सकृत में संग्रहित होती है

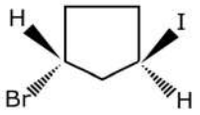
(4) इसकी न्यूनता मांसपेशियों में दुर्बलता बढ़ाती है

86.  $\xrightarrow[\text{acetone}]{\text{NaI(one mole)}}$ प्रमुख उत्पाद (P) है:

(1) 

(2) 

(3) 

(4) 

87. The basic strengths of the hydrides group 15 elements decreases in the order :

(1) $SbH_3 > PH_3 > AsH_3 > NH_3$

(2) $NH_3 > SbH_3 > PH_3 > AsH_3$

(3) $NH_3 > PH_3 > AsH_3 > SbH_3$

(4) $SbH_3 > AsH_3 > PH_3 > NH_3$

88. The compound has $3d^24s^2$ configuration is related to which block -

(1) s-block

(2) p-block

(3) d-block

(4) f-block

89. The element having lowest ionisation energy among the following is:

(1) $1s^2, 2s^2\ 2p^3$

(2) $1s^2, 2s^2\ 2p^6, 3s^1$

(3) $1s^2, 2s^2\ 2p^6$

(4) $1s^2, 2s^2\ 2p^5$

90. The correct ionic radii order is:

(1) $N^{3-} > O^{2-} > F^- > Na^+ > Mg^{2+} > Al^{3+}$

(2) $N^{3-} > Na^+ > O^{2-} > F^- > Mg^{2+} > Al^{3+}$

(3) $Na^+ > O^{2-} > N^{3-} > F^- > Mg^{2+} > Al^{3+}$

(4) $O^{2-} > F^- > Na^+ > N^{3-} > Mg^{2+} > Al^{3+}$

87. समूह 15 के तत्वों के हाइड्राइडों के क्षारीय सामर्थ्य का घटता क्रम है :-

(1) $SbH_3 > PH_3 > AsH_3 > NH_3$

(2) $NH_3 > SbH_3 > PH_3 > AsH_3$

(3) $NH_3 > PH_3 > AsH_3 > SbH_3$

(4) $SbH_3 > AsH_3 > PH_3 > NH_3$

88. $3d^24s^2$ इलेक्ट्रॉनिक विन्यास वाला यौगिक किस ब्लॉक से संबन्धित है -

(1) s - ब्लॉक

(2) p - ब्लॉक

(3) d - ब्लॉक

(4) f - ब्लॉक

89. निम्न मे न्यूनतम आयनन ऊर्जा रखने वाला तत्व है

(1) $1s^2, 2s^2\ 2p^3$

(2) $1s^2, 2s^2\ 2p^6, 3s^1$

(3) $1s^2, 2s^2\ 2p^6$

(4) $1s^2, 2s^2\ 2p^5$

90. सही आयनिक त्रिज्या क्रम है

(1) $N^{3-} > O^{2-} > F^- > Na^+ > Mg^{2+} > Al^{3+}$

(2) $N^{3-} > Na^+ > O^{2-} > F^- > Mg^{2+} > Al^{3+}$

(3) $Na^+ > O^{2-} > N^{3-} > F^- > Mg^{2+} > Al^{3+}$

(4) $O^{2-} > F^- > Na^+ > N^{3-} > Mg^{2+} > Al^{3+}$

91. Which of the following insect is a social animal

(1) Locust

(2) Bed bug

(3) Termite

(4) Mosquito

92. When the filaments are attached to the carpels throughout their whole length or by their anthers only, the condition is called

(1) Epipetalous

(2) Gynandrous

(3) Epiphyllous

(4) None of these

93. Which of the following sequences is correct to initiate expiration ?

I. Relaxation of external intercostals muscles and return of diaphragm and sternum to their normal position

II. Air expelled from lungs

III. Volume of thorax decreases

IV. Intrapulmonary pressure increases

(1) I, III, IV, II

(2) II, IV, III, I

(3) IV, III, II, I

(4) I, II, III, IV

94. Read the following statements and choose the **correct** option -

Statement A : Bt toxin gets activated in alkaline pH of insect gut, which solubilizes the protein crystals.

Statement B : Activated toxin binds to the surface of midgut epithelial cells.

(1) Only statement A is correct

(2) Only statement B is correct

(3) Both A and B statements are correct

(4) Both A and B statements are incorrect

91. निम्नलिखित में से कौनसा कीट एक सामाजिक जीव है?

(1) टिड्डी

(2) खटमल

(3) दीमक

(4) मच्छर

92. जब तंतु संपूर्ण लम्बाई में या केवल उनके परागकोष द्वारा अण्डप से जुड़े होते हैं, तो इस स्थिति को कहा जाता है

(1) दललग्न

(2) पुंजायांगी

(3) परिदल लग्न

(4) इनमें से कोई नहीं

93. निःश्वसन के प्रारम्भ करने में निम्नलिखित में से सही क्रम कौनसा है ?

I. बाह्य अर्न्तपर्शुक पेशियों का शिथिलन एवं तनुपट एवं स्टर्नम का अपनी सामान्य स्थिति में वापस आना

II. फुफ्फस से वायु का निष्कासन

III. वक्ष का आयतन घटना

IV. अन्तः फुफ्फुस दाब बढ़ना

(1) I, III, IV, II

(2) II, IV, III, I

(3) IV, III, II, I

(4) I, II, III, IV

94. निम्न कथनो को पढ़े तथा **सही** विकल्प का चयन करे-

कथन A : Bt टॉक्सिन कीट की आंत के क्षारीय pH मे सक्रिय हो जाता है, जो प्रोटीन क्रिस्टल को घोल देता हैं।

कथन B : सक्रिय टॉक्सिन मध्यांत्र उपकला कोशिकाओं की सतह से बंध जाता है।

(1) केवल कथन A सही है

(2) केवल कथन B सही है

(3) A और B दोनों कथन सही हैं

(4) A और B दोनों कथन गलत हैं

95. In the structure of blastocyst, the stem cells for the formation of whole embryo are form by-

(1) Trophoblast cells

(2) Cells of Rauber

(3) Inner cell mass

(4) Granulosa cells

96. **Statement A** : Living organisms are self-replicating, evolving and self-regulating interactive systems capable of responding to external stimuli.

Statement B : All living organisms are linked to one another by the sharing of the common genetic material.

(1) Only statement A is incorrect

(2) Only statement B is incorrect

(3) Both statements A and B are incorrect

(4) Both statements A and B are correct

97. Noncyclic photophosphorylation differs from cyclic photo phosphorylation in involvment of:-

(1) Only PSI

(2) Evolution of oxygen

(3) Reduction of $NADP^+$

(4) Both (2) and (3)

98. In the rest state, a subunit of troponin masks:

(1) Active binding sites for actin on the myosin filaments

(2) Active binding sites for myosin on the myosin filaments

(3) Active binding sites for myosin on the actin filaments

(4) Active binding sites for actin on the actin filaments

99. $\oplus \male K_{(5)} \overset{\frown}{C_{(5)} A_5} \underline{G_{(2)}}$

Which of the following is wrong information about this floral formula.

(1) It can be observed in Tulip.

(2) It shows epiphyllous condition

(3) Ovary tricarpellary and superior

(4) All of the above

95. ब्लास्टोसिस्ट की संरचना में, सम्पूर्ण भ्रूण के निर्माण के लिए स्टेम कोशिकाएँ किसके द्वारा बनती हैं-

(1) ट्रोफोब्लास्ट कोशिकाएँ

(2) रॉबर कोशिकाएँ

(3) अंत: कोशिका समूह

(4) ग्रैनुलोसा कोशिकाएँ

96. **कथन A:** जीवित जीव स्वप्रतिकृति, विकासशील तथा स्वनियमनकारी पारस्परिक क्रियाशील तन्त्र है, जो बाह्य उद्दीपन के प्रति अनुक्रिया प्रदर्शित करने की क्षमता रखते है।

कथन B: सभी जीवित जीव एक-दुसरे से उभयनिष्ठ आनुंवाशिक पदार्थ की साझेदारी द्वारा संबद्ध है।

(1) केवल कथन A सही गलत है।

(2) केवल कथन B गलत है।

(3) दोनों कथन A एवं B गलत है।

(4) दोनों कथन A एवं B सही है।

97. अ-चक्रीय प्रकाश फॉस्फोरिलीकरण चक्रीय प्रकाश फॉस्फोरिलीकरण से भिन्न होता है जिसमें होता है:-

(1) केवल PSI

(2) ऑक्सीजन का निष्कासन

(3) $NADP^+$ का अपचयन

(4) दोनो (2) एवं (3)

98. विश्राम अवस्था में, ट्रोपोनिन की उपइकाई (subunit) आवरित करती है/ विलोपन करती है:

(1) मायोसिन तन्तु पर ऐक्टिन के लिये सक्रिय बन्धन स्थल को

(2) मायोसिन तन्तु पर मायोसिन के लिये सक्रिय बन्धन स्थल को

(3) ऐक्टिन तन्तु पर मायोसिन के लिये सक्रिय बन्धन स्थल को

(4) ऐक्टिन तन्तु पर ऐक्टिन के लिये सक्रिय बन्धन स्थल को

99. $\oplus \male K_{(5)} \overset{\frown}{C_{(5)} A_5} \underline{G_{(2)}}$

पुष्प सूत्र के बारे में निम्न में से कौनसी सूचना गलत है-

(1) यह ट्यूलिप में देखा जा सकता है

(2) यह परिदललग्न स्थिति दर्शाता है।

(3) अण्डाशय त्रिअण्डपी एवं उर्ध्ववर्ती

(4) उपरोक्त सभी

100. The world's problem No. 1 today is :

(1) Population explosion

(2) Pollution

(3) Nuclear proliferation

(4) Natural calamities

101. **Assertion (A) :** The amount of CO_2 that can diffuse through the diffusion membrane per unit difference in partial pressure is much higher compared to that of O_2.
Reason (R) : The solubility of CO_2 is 20-25 times higher than that of O_2 solubility.
(1) If both assertion and reason are true and reason is the correct explanation of assertion.

(2) If both assertion and reason are true but reason is not the correct explanation of assertion.

(3) If assertion is true but reason is false.

(4) If both assertion and reason are false.

102. C-peptide of human insulin is :

(1) A part of mature insulin molecule

(2) Responsible for the formation of disulphide bridges

(3) Removed during the maturation of pro-insulin to insulin

(4) Responsible for its biological activity

103. Which is **wrong** statement about Placenta ?

(1) Placenta facilitate supply of oxygen nutrients to the embryo

(2) Placenta connects to the embryo with cord like structure is known as an umbilical cord.

(3) Placenta formation is done only by maternal tissue.

(4) Placenta acts as an endocrine tissue and secretes several hormones

104. ICZN stands for-

(1) International Code of Zoological Nomenclature

(2) Indian Cattle for Zoological Names

(3) International Congress of Zoological Nomenclature

(4) Indian Code of Zoological Nomenclature

100. आज की दुनिया की समस्या नंबर 1 है :

(1) जनसंख्या विस्फोट

(2) प्रदूषण

(3) नाभिकीय प्रसार

(4) प्राकृतिक आपदाएँ

101. **कथन (A) :** CO_2 की वह मात्रा जो प्रति ईकाई आंशिक दाब के अन्तर पर विसरण झिल्ली द्वारा विसरित होती है, O_2 की तुलना में अधिक होती है।
कारण (R) : O_2 की विलेयता की तुलना में CO_2 की विलेयता 20-25 गुणा अधिक है।
(1) यदि कथन एवं कारण दोनों सत्य हैं तथा कारण कथन का सही स्पष्टीकरण है।

(2) यदि कथन एवं कारण दोनों सत्य हैं, लेकिन कारण, कथन का सही स्पष्टीकरण नहीं है।

(3) यदि कथन सत्य है, लेकिन कारण असत्य है।

(4) यदि कथन व कारण दोनों असत्य हैं।

102. मानव इन्सुलिन का C-पेप्टाइड होता है :

(1) एक परिपक्व इन्सुलिन अणु का भाग

(2) डाईसल्फाइड सेतु के निर्माण के लिए उत्तरदायी

(3) प्राक्-इन्सुलिन से इन्सुलिन के परिपक्वन के दौरान हटाया गया

(4) इसकी जैविक क्रियाशीलता के लिए उत्तरदायी

103. अपरा के संबंध में कौन सा कथन गलत है

(1) अपरा भ्रूण को ऑक्सीजन पोषक की आपूर्ति करता है

(2) अपरा नाभि रज्जु नामक सरंचना द्वारा भ्रूण से जुड़ा होता है

(3) अपरा का निर्माण केवल मातृक ऊत्तकों द्वारा होता है

(4) अपरा अन्तः स्त्रावी ऊत्तकों की भांति कार्य करता है तथा कुछ हार्मोनों का स्त्रवण करता है।

104. ICZN का अर्थ है-

(1) इन्टरनेशनल कोड ऑफ जूलॉजिकल नॉमेनक्लेचर

(2) इन्डियन कैटल फॉर जूलॉजिकल नेम्स

(3) इन्टरनेशनल कांग्रेस ऑफ जूलॉजिकल नॉमेनक्लेचर

(4) इन्डियन कोड ऑफ जूलॉजिकल नॉमेनक्लेचर

105. Choose the **correct** match from option for column I, II and III related to ETS of respiration-

	Column-I		**Column-II**		**Column-III**
(i)	Complex-I	(a)	Succinate dehydrogenase	(p)	O_2 binding
(ii)	Complex-II	(b)	Mobile carrier	(q)	Transfer of e^- and H^+
(iii)	Ubiquinol	(c)	FMN	(r)	Mobile H-carrier
(iv)	Complex-IV	(d)	Copper containing	(s)	Step of Krebs cycle

(1) i-a-q, ii-d-r, iii-b-s, iv-c-p

(2) i-c-q, ii-a-r, iii-b-p, iv-d-s

(3) i-c-q, ii-a-s, iii-b-r, iv-d-p

(4) i-d-s, ii-c-r, iii-b-q, iv-a-p

106. Duration during which a nerve is not able to conduct another impulse after the conduction of one is called

(1) Chloride shift

(2) Na^+ , K^+ pump

(3) Absolute refractory period

(4) Saltation

107. The axillary bud of stems is modified into woody straight and pointed structure in

(1) *Bougainvillea*

(2) Citrus

(3) *Turmeric*

(4) Both (1) and (2)

108. **Assertion (A):** In joint diastole all the four chamber of heart are in relaxed state.
Reason (R): The tricuspid and bicuspid valves are open and the semilunar valves are closed at this stage.

(1) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**

(2) Both **(A)** and **(R)** are true but **(R)** is not the correct explanation of **(A)**

(3) **(A)** is true statement but **(R)** is false.

(4) Both **(A)** and **(R)** are false.

105. श्वसन के ETS से संबंधित कॉलम I, II और III के लिए विकल्प में से **सही** मिलान का 'चयन करें-

	कॉलम -I		**कॉलम -II**		**कॉलम -III**
(i)	कॉम्प्लेक्स-I	(a)	सक्सिनेट डीहाइड्रोजिनेज	(p)	O_2 बन्धन
(ii)	कॉम्प्लेक्स-II	(b)	गतिशील वाहक	(q)	e^- व H^+ का स्थानान्तरण
(iii)	यूबीक्विनोल	(c)	FMN	(r)	गतिशील H-वाहक
(iv)	कॉम्प्लेक्स-IV	(d)	तांबा युक्त	(s)	क्रेब्स चक्र का चरण

(1) i-a-q, ii-d-r, iii-b-s, iv-c-p

(2) i-c-q, ii-a-r, iii-b-p, iv-d-s

(3) i-c-q, ii-a-s, iii-b-r, iv-d-p

(4) i-d-s, ii-c-r, iii-b-q, iv-a-p

106. जिस अवधि के दौरान एक तंत्रिका एक उत्तेजना का संचरण करनें के पश्चात् दूसरी उत्तेजना का संचरण करने में सक्षम नहीं होती, उसे कहा जाता है-

(1) क्लोराइड शिफ्ट

(2) Na^+ , K^+ पंप

(3) पूर्ण विश्रांति काल

(4) उच्छलन (साल्टेशन)

107. तने की कक्षस्थ कलियाँ काष्ठीय, सीधे तथा नुकीली संरचना में परिवर्तित हो जाते है, यह किसमें पाया जाता है?

(1) बोगनविलिया

(2) नींबू

(3) हल्दी

(4) (1) और (2) दोनों

108. **अभिकथन (A):** संयुक्त शिथिलन में हृदय के चारों कक्ष विश्राम अवस्था में होते हैं।
कारण (R): इस स्थिति में त्रिवलनी तथा द्विवलनी कपाट खुले और अर्धचन्द्राकार कपाट बन्द होते है।

(1) दोनों **(A)** एवं **(R)** सही है लेकिन **(R)**, **(A)** की सही व्याख्या है।

(2) दोनों **(A)** एवं **(R)** सही है लेकिन **(R)**, **(A)** की सही व्याख्या नहीं है।

(3) **(A)** सही है लेकिन **(R)** गलत है।

(4) **(A)** तथा **(R)** दोनों ही असत्य है।

109. Assertion :- RNAi involves silencing of a specific mRNA due to complementary dsRNA that binds to & prevents translation of the mRNA.
Reason :- RNAi takes place in all prokaryotic organisms as a method of cellular defence.

(1) If both assertion and reason are true and reason is the correct explanation of assertion.

(2) If both assertion and reason are true but reason is not the correct explanation of assertion.

(3) If assertion is true but reason is false.

(4) If both assertion and reason are false.

109. कथन :- RNAi में एक पूरक dsRNA विशिष्ट mRNA से जुडकर उसका संदमन कर देता है तथा उस mRNA का अनुवादन रोक देता है।
कारण :- RNAi सभी प्रोकेरियोटिक जीवों में कोशिकीय प्रतिरक्षा की एक विधि है।

(1) यदि कथन एवं कारण दोनों सत्य हैं तथा कारण कथन का सही स्पष्टीकरण है।

(2) यदि कथन एवं कारण दोनों सत्य हैं, लेकिन कारण, कथन का सही स्पष्टीकरण नहीं है।

(3) यदि कथन सत्य है, लेकिन कारण असत्य है।

(4) यदि कथन व कारण दोनों असत्य हैं।

110. Ovulation in the human female normally takes place during the menstrual cycle:-

(1) At the begining of the follicular phase

(2) At the end of the follicular phase

(3) At the mid secretory phase

(4) Just before the end of the secretory phase

110. रज चक्र के दौरान मानव महिलाओं में अण्डोत्सर्ग सामान्यतः होता है-

(1) पुटीकीय अवस्था के प्रारम्भ में

(2) पुटीकीय अवस्था के अन्त में

(3) स्त्रावी अवस्था के मध्य में

(4) स्त्रावी अवस्था के अन्त के ठीक पहले

111. Nostoc and Anabaena belongs to :

(1) Eubacteria

(2) Archaebacteria

(3) Cyanobacteria

(4) Coccibacteria

111. नॉस्टोक एवं एनाबीना किससे सम्बन्धित हैं -

(1) यूबैक्टीरिया/सत्य जीवाणु

(2) आर्कीबैक्टीरिया/आध्य जीवाणु

(3) सायनोबैक्टीरिया/नील हरित जीवाणु

(4) कॉकीबैक्टीरिया/गोलाकार जीवाणु

112. If natality and mortality of a population are nearly same it will be termed as

(1) Declining population

(2) Growing population

(3) Young population

(4) Stable population

112. यदि किसी समष्टि की जन्म दर तथा मृत्युदर लगभग समान हो तो उसे क्या कहते है

(1) समष्टि पतन

(2) वृद्धि करती हुई समष्टि

(3) तरूण समष्टि

(4) स्थायी समष्टि

113. ATP : $NADPH_2$: CO_2 consumption ratio during the photosynthesis in the C_3 plant :

(1) 3 : 2 :1

(2) 1 : 2 :3

(3) 2 : 3 :1

(4) 1 : 2 :4

113. C_3 पादपो में प्रकाश संश्लेषण के दौरान ATP: $NADPH_2$: CO_2 की खपत का अनुपात है।

(1) 3 : 2 :1

(2) 1 : 2 :3

(3) 2 : 3 :1

(4) 1 : 2 :4

114. Real the following statements carefully and select the statement which is not correct.

(1) The forebrain consists of cerebrum thalamus and hypothalamus.

(2) A deep cleft divides the cerebrum horizontally into two halves, termed as cerebral hemisphere.

(3) Cerebral cortex is grey matter

(4) All are correct.

115. Which of the following statements is true for stem (dicot / monocot)?

(1) Ring arrangement of vascular bundles is found in dicot stem

(2) Vascular bundles are conjoint and open in monocot stem

(3) Hypodermis is parenchymatous in monocot stem

(4) None of the above

116. Consider the following statement A – D with certain blanks. Find the option which **correctly** fills up these blanks.

A. Formed elements of blood constitute nearly ____ **i** _____of blood.

B. ____ **ii** ____are the most abundant blood cells.

C. A healthy adult man on an average contains ____ **iii** ____RBCs mm^{-3} of blood.

D. ____ **iv** ____is considered as graveyard of RBCs.

(1) **(i)** – 45% , **(ii)** – Erythrocytes, **(iii)** – 4.0 – 4.5 million, **(iv)** – Spleen

(2) **(i)** – 55%, **(ii)** – Neutrophils, **(iii)** – 5.0 – 5.5 million, **(iv)** – liver

(3) **(i)** – 45% , **(ii)** – Erythrocytes, **(iii)** – 5.0 – 5.5 million, **(iv)** – Spleen

(4) **(i)** – 45%, **(ii)** – neutrophils, **(iii)** – 5.0 – 5.5 million, **(iv)** – Spleen

117. Which indian plants have been either patented or attempts have been made to patent them by western nations for their commercial use ?

(1) Basmati rice

(2) Turmeric

(3) Neem

(4) All of the above have been targetted

114. निम्नलिखित कथनों को ध्यान से पढ़ें और वह कथन चुनें जो सही नहीं है।

(1) अग्र मस्तिष्क प्रमस्तिष्क, थेलेमस और हाइपोथेलेमस का बना होता हैं

(2) एक गहरी क्षैतिज विदर प्रमस्तिष्क को दो भागों, में विभक्त करती है जिसे प्रमस्तिष्क गोलार्द्ध करते है।

(3) सेरेब्रल कॉर्टेक्स (प्रमस्तिष्क वल्कुट) धुसर द्रव्य है

(4) सभी सही हैं।

115. निम्न में से कौनसा कथन तने (एकबीजपत्री/द्विबीजपत्री) के लिए सही है-

(1) संवहन पूल की वलय व्यवस्था द्विबीजपत्री तने में पायी जाती है।

(2) एकबीजपत्री में संवहन पूल संयुक्त तथा खुले होते हैं

(3) एक बीजपत्री तने में मृदूतकीय कोशिकाओं की हाइपोडर्मिस होती हैं

(4) उपरोक्त में से कोई नही

116. कुछ रिक्त स्थान के साथ निम्नलिखित A से D पर विचार करे उस विकल्प का पता लगाएं जो इन रिक्त स्थान को **सही** से भरता है।

A. रक्त के गठन तत्व रक्त के लगभग_____ **i** _____का गठन करते है।

B. _____ **ii** _____सबसे ज्यादा पाये जाने वाली रक्त कोशिका है।

C. औसतन एक स्वस्थ वयस्क व्यक्ति के रक्त में_____ **iii** _____RBC mm^{-3} होता है।

D. _____ **iv** _____ को RBC का कब्रिस्तान माना जाता है।

(1) **(i)** – 45% , **(ii)** – इरिथ्रोसाइट् **(iii)** – 4.0 – 4.5 मिलियन, **(iv)** – प्लीहा

(2) **(i)** – 55%, **(ii)** – न्युट्रोफिल्स, **(iii)** – 5.0 – 5.5 मिलियन, **(iv)** – यकृत

(3) **(i)** – 45% , **(ii)** – इरिथ्रोसाइट्, **(iii)** – 5.0 – 5.5 मिलियन, **(iv)** – प्लीहा

(4) **(i)** – 45%, **(ii)** – न्युट्रोफिल्स, **(iii)** – 5.0 – 5.5 मिलियन, **(iv)** – प्लीहा

117. किन भारतीय पौधों का या तो पेटेंट कराया गया है या पश्चिमी देशों द्वारा उनके व्यावसायिक उपयोग के लिए पेटेंट कराने का प्रयास किया गया है?

(1) बासमती चावल

(2) हल्दी

(3) नीम

(4) उपरोक्त सभी को लक्षित किया गया है

118. Which one of the following groups includes all sexually transmitted diseases?

(1) AIDS, syphilis, cholera

(2) HIV, malaria, trichomoniasis

(3) Gonorrhoea, hepatitis-B, chlamydiasis

(4) Hepatitis-B, haemophilia, AIDS

119. Select the kingdom of organism may represent autotrophic mode of nutrition.

A. Monera B. Protista
C. Fungi D. Plantae

(1) A, B and C

(2) A, B and D

(3) B, D and E

(4) C, D and E

120. Natality is the characteristic of a population which means:-

(1) The total number of individual's death present per unit area at a given time

(2) The increase in number of individuals in a population under given environmental conditions

(3) Loss of individuals due to death in a population under given environmental conditions

(4) Each population has three different age groups

121. Match the columns-I and II and choose the correct combination from the options given below.

	Column-I (Scientist)		**Column-II (Experimental material)**
(a)	Joseph Priestley	(i)	Purple and green Sulphur bacteria
(b)	T.W. Engelmann	(ii)	Aquatic plant
(c)	Cornelius van Niel	(iii)	Cladophora
(d)	Ingenhousz	(iv)	Mint plant

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

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

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

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

118. निम्नलिखित में से कौनसे समूह में सभी यौन संचारित रोग शामिल है?

(1) एड्स, सिफिलिस, हैजा

(2) एचआईवी, मलेरिया, ट्राइकोमोनियासिस

(3) गोनोरिया, हेपेटाइटिस-B, क्लैमाइडिएसिस

(4) हेपेटाइटिस-B, हीमोफिलिया, एड्स

119. जीवों के जगत को चयनित कीजिये जो स्वपोषी पोषण की विधि प्रदर्शित कर सकते है -

A. मोनेरा B. प्रोटिस्टा
C. कवक D. पादप

(1) A, B तथा C

(2) A, B तथा D

(3) B, D तथा E

(4) C, D तथा E

120. जन्मदर (Natality) किसी जनसंख्या की विशेषता होती है इसका अर्थ है:-

(1) प्रति इकाई क्षेत्र में एक निश्चित अवधि मे मृतकों की कुल संख्या

(2) एक निश्चित वातावरण में किसी समष्टि के सदस्यों की संख्या में बढ़ोत्तरी

(3) एक निश्चित वातावरण में किसी जनसंख्या के सदस्यों की संख्या में मृत्यु के कारण कमी

(4) प्रत्येक जनसंख्या में तीन भिन्न-भिन्न आयु समूह होते हैं।

121. कॉलम-I और II का मिलान करें और दिए गए विकल्पों में से सही संयोजन चुनें।

	कॉलम-I (वैज्ञानिक)		**कॉलम-II (प्रायोगिक सामग्री)**
(a)	जोसेफ प्रीस्टले	(i)	बैंगनी और हरे सल्फर बैक्टीरिया
(b)	T.W. एंगेलमैन	(ii)	जलीय पादप
(c)	कॉर्नेलियस वैन नील	(iii)	क्लैडोफोरा
(d)	इंजनहाउस	(iv)	पुदीना का पौधा

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

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

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

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

122. Hormone receptors are made up of:-

(1) Protein

(2) Steroid

(3) Amino acid

(4) All of the above

123. In young stem, the vascular cambium is:-

(1) single layered

(2) bilayered

(3) trilayared

(4) does not exist

124. Which of the following is not correct with respect to human kidney?

(1) The peripheral region is called cortex and central is called medulla

(2) Malpighian corpuscles are present in the cortical region

(3) Blood enters glomerulus through efferent arterioles

(4) The notch on concave part of kidney is called hilum

125. Following are the statements with reference to 'lipids'.

(a) Lipids having only single bonds are called unsaturated fatty acids.
(b) Lecithin is a phospholipid
(c) Trihydroxy propane is glycerol.
(d) Palmitic acid has 20 carbon atoms including carboxyl carbon.
(e) Arachidonic acid has 16 carbon atoms.

Choose the **correct** answer from the options given below.

(1) (b) and (e) only

(2) (a) and (b) only

(3) (c) and (d) only

(4) (b) and (c) only

126. According to Hugo De Vries speciation due to mutation is also known as 'Saltation' which means

(1) Single step variation

(2) Variations at regular intervals

(3) Single step large mutation

(4) Huge change due to Natural selection

122. हॉर्मोन ग्राही (Hormone receptors) किसके बने होते है-

(1) प्रोटीन के

(2) स्टीरॉइड के

(3) अमीनो अम्ल के

(4) उपरोक्त सभी

123. तरूण तने में, संवहन एधा होती है-

(1) एकल परतीय

(2) द्विपरतीय

(3) त्रिपरतीय

(4) अस्तित्व में नही होती

124. निम्न में से कौनसा कथन मानव वृक्क के संदर्भ में सही नहीं है?

(1) परिधीय भाग को वल्कुट (कार्टेक्स) और केन्द्रीय भाग को मध्यांश कहते है

(2) मैल्पीघियन कार्पस्कल्स (कणिकाएँ), कॉर्टीकल क्षेत्र में उपस्थित रहता है

(3) केशिका गुच्छ में रूधिर अपवाही धमनिकाओं द्वारा प्रवेश करता है

(4) वृक्क के अवतल भाग पर उपस्थित खांच को हाइलम कहते है

125. लिपिड से संबंधित कथन नीचे दिए गए है।
(a) ऐसे लिपिड जिनमें केवल एकल बंध होते है उन्हें असंतृप्त वसा अम्ल कहते है।
(b) लेसिथिन फॉस्फोलिपिड है।
(c) ट्राइहाइड्रॉक्सी प्रॉपेन ग्लिसरॉल है।
(d) पाल्मिटिक अम्ल में कार्बोक्सिल कार्बन सहित 20 कार्बन के परमाणु होते हैं।
(e) ऐरेकिडोनिक अम्ल में 16 कार्बन परमाणु होते है।

निम्न विकल्पों से उचित उत्तर का चयन करो।

(1) केवल (b) एवं (e)

(2) केवल (a) एवं (b)

(3) केवल (c) एवं (d)

(4) केवल (b) एवं (c)

126. ह्यूगोडीब्रिज के अनुसार उत्परिवर्तन के द्वारा प्रजाति निर्माण उच्छलन (Saltation) कहलाता है जिसका अर्थ है:-

(1) एक पदीय विभिन्नताएँ

(2) एक निश्चित अन्तराल पर विभिन्नताएँ

(3) विशाल उत्परिवर्तन का एक बड़ा कदम

(4) प्राकृतिक चयन के कारण बड़ा परिवर्तन

127. In fungi, the fusion of protoplasm between two motile or non-motile gametes is called:-

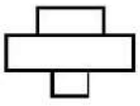
(1) Plasmogamy

(2) Plasmokinesis

(3) Karyogamy

(4) Cytokinesis

128. The below spindle shaped pyramid is of



(1) Pond ecosystem

(2) Marine ecosystem

(3) Tree ecosystem

(4) Grass land ecosystem

129. Choose the correct combination between respiratory substrates and their respective RQs:

(1) **Carbohydrate – 2, Fat – 1, Protein – 1**

(2) **Carbohydrate – 0, Fat – 1, Protein – 1**

(3) **Carbohydrate – 1, Fat – 0.7, Protein – 0.9**

(4) **Carbohydrate – 0.58, Fat – 0.5, Protein – 0.5**

130. **Assertion :** PTH hormone also know as "Hyper calcemic" hormone.
Reason : PTH stimulates reabsorption of Ca^{+2} by the renal tubules

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(3) (A) is correct but (R) is not correct

(4) (A) and (R) are incorrect

131. Mendel's law apply only when -

(1) In monohybrid cross shows two types of individuals in F_1

(2) The characters are linked

(3) Parents are pure breeding

(4) First pair of contrasting character is dependent upon other pairs

127. कवक में, दो चल व अचल युग्मको के मध्य जीवद्रव्य का संलयन कहलाता है-

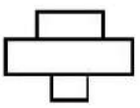
(1) प्लाज्मोगेमी(कोशिकाद्रव्य संलयन)

(2) प्लाज्मोकाइनेसिस (कोशिका विभाजन)

(3) केरियोगेमी (केन्द्रक संलयन)

(4) साइटोकाइनेसिस (कोशिकाद्रव्य विभाजन)

128. नीचे दी गई तर्कुकार आकृत्ति का पिरामिड है



(1) तालाब पारिस्थितिक तंत्र का

(2) समुद्री पारिस्थितिक तंत्र का

(3) वृक्ष पारिस्थितिक तंत्र का

(4) घास स्थल पारिस्थितिक तंत्र का

129. श्वसन क्रियाधार पदार्थ तथा उसके संगत RQs के मध्य सही संयोजन को चुनिये:-

(1) **कार्बोहाइड्रेट – 2, वसा – 1, प्रोटीन – 1**

(2) **कार्बोहाइड्रेट – 0, वसा – 1, प्रोटीन – 1**

(3) **कार्बोहाइड्रेट – 1, वसा – 0.7, प्रोटीन – 0.9**

(4) **कार्बोहाइड्रेट – 0.58, वसा – 0.5, प्रोटीन – 0.5**

130. **कथन:** PTH हार्मोन को "हाइपरकैल्सीमिक" हार्मोन भी कहा जाता है।
कारण: PTH वृक्कीय नलिकाओं द्वारा Ca^{+2} का पुनःअवशोषण बढ़ाता है।

(1) दोनों (A) और (R) सही हैं और (R) (A) की सही व्याख्या है।

(2) दोनों (A) और (R) सही हैं लेकिन (R) (A) की सही व्याख्या नहीं है।

(3) (A) सही है लेकिन (R) गलत है।

(4) (A) और (R) दोनों गलत हैं।

131. मेंडल का नियम तभी लागू होता है जब -

(1) F_1 में एकल संकरण में दो प्रकार के व्यष्टि दिखाई देते हैं

(2) लक्षण जुड़े हुए होते हैं

(3) माता-पिता शुद्ध जनन करते है।

(4) विपरीत लक्षण वाला पहला युग्म अन्य युग्मों पर निर्भर होता है

132. Different types of excretory structures and animals are given below. Match them appropriately and mark the **correct** answer from among those given below :

	Excretory structure/organ		Animals
(A)	Protonephridia	(i)	Prawn
(B)	Nephridia	(ii)	Cockroach
(C)	Malpighian tubules	(iii)	Earthworm
(D)	Green gland or Antennal gland	(iv)	Flatworms

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

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

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

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

133. Which of the following statement are **true/false ?**

I. Cell aggregate body plan is found in phylum Platyhelminthes.

II. Radial symmetry is the most common symmetry found in animals

III. Pseudocoelom is only found in phylum Aschelminthes.

IV. All triploblastic animals have a true coelom.

V. Haemocoel is sometimes observed in animals belonging to phylum–Platyhelminthes.

(1) I and V are true and II, III and IV are false

(2) II, III and V are true and I and IV are false

(3) I, II and III are true and IV and V are false

(4) I, II, IV and V are false, only III is true

134. Consider the following statements:

(a) Dryopithecus and Ramapithecus lived on Earth about 15 mya.

(b) They were primates with a hairy appearance and walked like gorillas.

Choose the correct option.

(1) Both (a) and (b) are true.

(2) (a) is true but (b) is false.

(3) Both (a) and (b) are false.

(4) (a) is false but (b) is true.

132. यहाँ विभिन्न प्रकार की उत्सर्जी संरचनाएँ और प्राणियों के नाम दिये गए है उनका सही-सही मिलान कीजिये, और दिए गए विकल्पों में से **सही** विकल्प चुनिये -

	उत्सर्जन अंग / संरचना		प्राणी का नाम
(A)	प्रोटोनेफ्रिडिया	(i)	झींगा
(B)	नेफ्रिडिया	(ii)	तिलचट्टा
(C)	मैल्पीगी नलिकाएँ	(iii)	केंचुआ
(D)	ग्रीन ग्रंथि अथवा श्रृंगिक ग्रंथि	(iv)	चपटे कृमि

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

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

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

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

133. निम्न में से कौनसे कथन **सत्य/ असत्य** है ?

I. संघ प्लेटिहेल्मिन्थीज में कोशिका समूहन प्रकार का शारीरिक संगठन पाया जाता है।

II. जन्तुओं में अधिकांशतया अरीय सममिति पाई जाती है।

III कूटदेहगुहा, केवल संघ एस्केलमिन्थीज में पायी जाती है।

IV. सभी त्रिकोरकी जन्तुओं में वास्तविक प्रगुहा पाई जाती है।

V. संघ प्लैटिहैल्मिन्थीज से सम्बन्धित जन्तुओं में कभी-कभी हीमोसील (रक्त गूहा) देखी जा सकती है।

(1) I एवं V सत्य है तथा II, III एवं IV असत्य है।

(2) II, III एवं V सत्य है तथा I एवं IV असत्य है।

(3) I, II एवं III सत्य है तथा IV एवं V असत्य है।

(4) I, II, IV एवं V असत्य है तथा केवल III सत्य है।

134. निम्नलिखित कथनों पर विचार करें-

(a) ड्रायोपिथेकस और रामापिथेकस पृथ्वी पर लगभग 15 मिलियन वर्ष पहले रहते थे।

(b) वे प्राइमेट्स थे जिनकी त्वचा पर बाल थे और वे गोरिल्लों की तरह चलते थे।

सही विकल्प चुनिए

(1) दोनों (a) और (b) सत्य हैं।

(2) (a) सत्य है, परंतु (b) असत्य है।

(3) दोनों (a) और (b) असत्य हैं।

(4) (a) असत्य है, परंतु (b) सत्य है।

135. Sexual reproduction in spirogyra is:-

(1) Oogamous

(2) Anisogamous

(3) Cleistogamous

(4) Isogamous

136. The statement, 'Tiger is in the apex of food chain', indicates-

(1) Tiger has many enemies

(2) Tiger has maximum biomass

(3) Tiger is omnivorous

(4) low energy at its trophic level

137. **Assertion :-** In plants there is no need of respiratory and Circulatory system.
Reason:- In plants most of the cells have at least a part of their surface in contact with air and an interconnected network of air spaces.

(1) If both assertion and reason are true and reason is the correct explanation of assertion.

(2) If both assertion and reason are true but reason is not the correct explanation of assertion.

(3) If assertion is true but reason is false.

(4) If both assertion and reason are false.

138. Which of the following is not derived from cholesterol?

(1) Vitamin-D

(2) Insulin

(3) Bile juice

(4) Sex hormone

135. स्पाइरोगायरा में लैंगिक जनन होता है-

(1) अण्डयुग्मन

(2) असमयुग्मकी

(3) अनुन्मील्य

(4) समयुग्मकी

136. "बाघ खाद्य श्रृंखला के शीर्ष पर है", कथन दर्शाता है-

(1) बाघ के कई शत्रु हैं।

(2) बाघ का जैवभार अधिकतम है।

(3) बाघ सर्वाहारी है।

(4) इस पोषण स्तर पर कम ऊर्जा होती है।

137. **कथन :** पादपों में श्वसन तंत्र एवं परिसंचरण तंत्र की आवश्यकता नहीं होती है।
कारण :. पादपों की अधिकांश कोशिकाओं की सतह का कम से कम एक भाग वायु के सम्पर्क में रहता है तथा वायु अवकाशों का अंतर्सम्बंधित जाल पाया जाता है।

(1) यदि कथन एवं कारण दोनों सत्य हैं तथा कारण कथन का सही स्पष्टीकरण है।

(2) यदि कथन एवं कारण दोनों सत्य हैं, लेकिन कारण, कथन का सही स्पष्टीकरण नहीं है।

(3) यदि कथन सत्य है, लेकिन कारण असत्य है।

(4) यदि कथन व कारण दोनों असत्य हैं।

138. निम्नलितिख में से कौनसा कोलेस्ट्रॉल से व्युत्पन्न नहीं होता है?

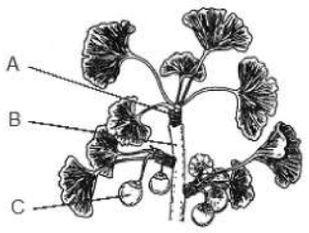
(1) विटामिन-D

(2) इंसुलिन

(3) पित्त रस

(4) लिंग हार्मोन

139. Identity the plant and the structures marked as A, B and C :



(1) Pinus, A=Long shoot, B=Dwarf shoot, C=Seed

(2) Cycas, A=Long shoot, B=Dwarf shoot, C=Seed

(3) Ginkgo, A=Long shoot, B=Dwarf shoot, C=Fruits

(4) Ginkgo, A=Dwarf shoot, B=Long shoot, C= Seeds

140. Consider the following statement :

(I) Multiple Allelism can be studied in population only not in individual organism.
(II) Organism are Diploid.

(1) Both statements are correct and II^{nd} statement justify I^{st} statement.

(2) Both statements are independently correct and II^{nd} statement not justify I^{st}

(3) I^{st} correct, II^{nd} incorrect.

(4) I^{st} incorrect, II^{nd} correct.

141. **Statement I :** DCT is also capable of reabsorption of HCO_3^- and selective secretion of hydrogen and potassium ions and NH_3 to maintain the pH and sodium-potassium balance in blood.

Statement II : Collecting duct plays a role in the maintenance of pH and ionic balance of blood by the selective secretion of H^+ and K^+ ions.

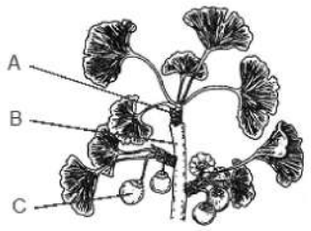
(1) Both statements **I** and **II** are correct

(2) Both statements **I** and **II** are incorrect

(3) Only statement **I** is correct

(4) Only statement **II** is correct

139. पौधे को पहचाने A, B और C संरचना का चिन्हित करे :



(1) पाइनस, A = लम्बा तना, B = बौना तना, C = बीज

(2) सायकस, A = लम्बा तना, B = बौना तना, C = बीज

(3) गिन्को, A = लम्बा तना, B = बौना तना, C = फल

(4) गिन्को, A = बौना तना, B = लम्बा तना, C = बीज

140. निम्नलिखित कथन को देखें :-

(I) बहु युग्मविकल्पिता का अध्ययन केवल जनसंख्या में किया जा सकता हैं, अकेले जीव में नहीं।
(II) जीव द्विगुणित होते है।

(1) दोनों कथन सही हैं और दूसरा कथन पहले कथन का स्पष्टीकरण प्रस्तुत करता है।

(2) दोनों कथन एक दूसरे से स्वतंत्र रूप से सही है, तथा II^{nd} कथन I^{st} का स्पष्टीकरण नहीं देता हैं।

(3) I^{st} सही हैं, II^{nd} गलत है।

(4) I^{st} गलत हैं, II^{nd} सही है।

141. **कथन -I :** DCT रक्त में pH और सोडियम पोटेशियम संतुलन को बनाये रखने के लिए HCO_3^- के पुनः अवशोषण और हाइड्रोजन और पोटेशियम आयनो तथा NH_3 के चयनात्मक स्त्राव मे भी सक्षम होता है।

कथन-II : H^+ तथा K^+आयनो के चयनात्मक स्त्रवण द्वारा रक्त की pH और आयनिक संतुलन के सरक्षण में संग्राहक नलिका भूमिका निभाती है।

(1) दोनो कथन **I** तथा **II** सही है।

(2) दोनो कथन **I** तथा **II** गलत है।

(3) केवल कथन **I** सही है।

(4) केवल कथन **II** सही है।

142. Assertion (A) : Nematodes are commonly called round worms.

Reason (R) : Nematodes have tube within tube body plan.

(1) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**

(2) Both **(A)** and **(R)** are true but **(R)** is not the correct explanation of **(A)**

(3) **(A)** is true statement but **(R)** is false.

(4) Both **(A)** and **(R)** are false.

143. Which of the following ecological pyramids can be inverted ?

A. Pyramid of energy

B. Pyramid of number

C. Pyramid of biomass

(1) Only (A) and (B)

(2) Only (B)

(3) Only (B) and (C)

(4) All (A), (B) and (C)

144. Leaf abscission :

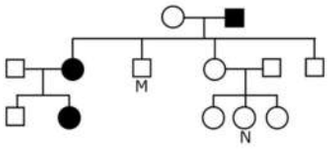
(1) is followed by leaf senescence

(2) is regulated by the hormone abscisic acid

(3) is a passive process, involving nothing more than death of petiole cells

(4) is associated with an increase in Cytokinin production by petiole cells

145. Fused ear lobe appears in the progeny due to an autosomal recessive gene. Find out the possible genotype of individuals of the family members marked as M and N:-



(1) M = Aa, N = AA or Aa

(2) M = AA, N = AA or Aa

(3) M = aa, N =aa

(4) M = Aa, N = aa

142. अभिकथन (A) : नीमेटोडा को सामान्यतया गोल कृमि कहा जाता है।

कारण (R) : निमेटोडा में नलिका में नलिका प्रकार का शारीरिक संगठन होता है।

(1) दोनों **(A)** एवं **(R)** सही है और **(R), (A)** की सही व्याख्या है।

(2) दोनों **(A)** एवं **(R)** सही है लेकिन **(R), (A)** की सही व्याख्या नहीं है।

(3) **(A)** सही है लेकिन **(R)** गलत है।

(4) **(A)** तथा **(R)** दोनों ही असत्य है।

143. निम्नलिखित में से किस पारिस्थितिक पिरामिड को उल्टा बनाया जा सकता है?

A. ऊर्जा का पिरामिड

B. संख्या का पिरामिड

C. जैवभार का पिरामिड

(1) केवल (A) और (B)

(2) केवल (B)

(3) केवल (B) और (C)

(4) (A), (B) और (C) सभी

144. पर्ण विगलन :

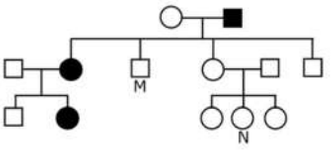
(1) इसके पश्चात् पर्ण जीर्णता द्वारा अनुसरण होता है।

(2) हार्मोन एब्सिसिक अम्ल द्वारा नियमित होता है।

(3) एक निष्क्रिय प्रक्रिया है, जिसमें पर्णवृन्त कोशिकाओं की मृत्यु से अधिक कुछ नहीं है।

(4) पर्णवृन्त कोशिकाओं द्वारा उत्पन्न साइटोकाइनिन की वृद्धि से संबंधित होता है।

145. एक ऑटोसोमल अप्रभावी जीन के कारण संतति में जुड़ी हुई कर्ण पालियां प्रकट होती है तो परिवार के सदस्यों M तथा N का संभावित जीनोटाइप संभव होगा-



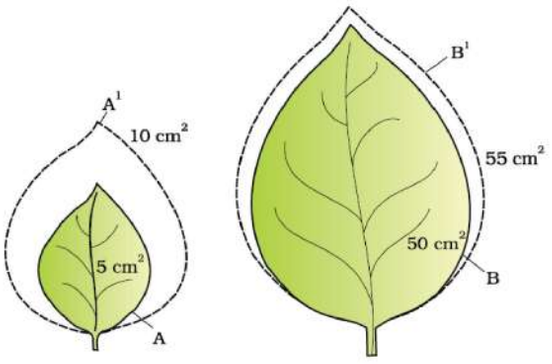
(1) M = Aa, N = AA or Aa

(2) M = AA, N = AA or Aa

(3) M = aa, N =aa

(4) M = Aa, N = aa

146. Choose the correct option –



(1) Absolute growth rate of A is more than that of B

(2) Absolute growth rate of B is more than that of A

(3) Relative growth rate of A is more than that of B

(4) Relative growth rate of B is more than that of A

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

	Animals	Morphological features
(a)	Liver fluke, Sea anemone, Ctenoplana	Bilateral symmetry
(b)	Echinus , Prawn, Aplysia	Joined appendages
(c)	Apis, Spider, Cockroach	Ventral solid central nervous system
(d)	Nereis, Locust, Taenia	Metameric segmentation

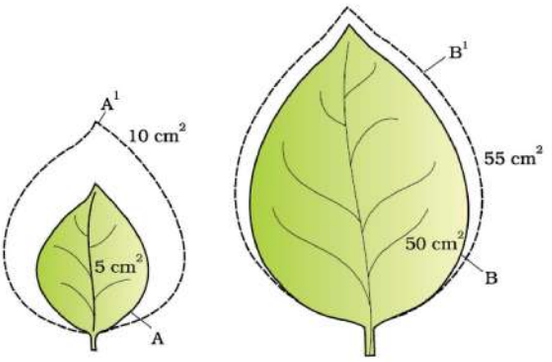
(1) (a)

(2) (b)

(3) (c)

(4) (d)

146. सही विकल्प का चयन कीजिए- –



(1) A की पूर्ण वृद्धि दर B की तुलना में अधिक है।

(2) B की पूर्ण वृद्धि दर A की तुलना में अधिक है।

(3) A की सापेक्ष वृद्धि दर B की तुलना में अधिक है।

(4) B की सापेक्ष वृद्धि दर A की तुलना में अधिक है।

147. निम्नलिखित तीन जन्तुओं के समूहों में से कौन सा एक उनकी एक विशिष्ट रूपात्मक विशेषता के साथ **सही** से मेल खाता है?

	जन्तु	रूपात्मक विशेषता
(a)	लीवर फ्लूक, समुद्री एनीमोन, टीनोप्लाना	द्विपार्श्व सममिति
(b)	इकाइनस, झींगा, एप्लाइसिया	संधि युक्त पाद
(c)	एपिस, मकड़ी, कॉकरोच	अधरीय ठोस केन्द्रीय तंत्रिका तंत्र
(d)	नेरीस, टिड्डी, टीनिया	वास्तविक खण्डीभवन

(1) (a)

(2) (b)

(3) (c)

(4) (d)

148. Consider the following statements and select the correct option w.r.t Cycas :
A. Unbranched stem
B. Dioecious plant
C. Leaves are simple, needle like
D. Presence of coralloid roots
E. Pollen grains are carried by air and insects

(1) A, B, D

(2) A, C, D

(3) A, B, D, E

(4) A, B, C, D, E

149. If we consider the number of insects feeding on a big tree pyramid will be-

(1) Upright

(2) Inverted

(3) Bell shape

(4) All of these

150. The linkage group in a human male is:-

(1) 23

(2) 24

(3) 46

(4) 22

151. The following are the statements about non- chordates:
A. Pharynx is perforated by gill slits.
B. Notochord is absent.
C. Central nervous system is dorsal.
D. Heart is dorsal if present.
E. Post anal tail is absent
Choose the most appropriate answer from the options given below:-

(1) B, D & E only

(2) B, C & D only

(3) A & C only

(4) A, B & D only

148. साइकस के संदर्भ में निम्नलिखित कथनों का अध्ययन करें तथा सही विकल्प का चयन कीजिए-
A. अशाखित तना
B. एकलिंगाश्रयी पादप
C. पत्तियाँ सामान्य, सुई जैसी होती हैं
D. प्रवाल मूल उपस्थित होती हैं
E. परागकण वायु तथा कीटों द्वारा फैलते हैं

(1) A, B, D

(2) A, C, D

(3) A, B, D, E

(4) A, B, C, D, E

149. यदि हम एक बड़े वृक्ष पर पोषण प्राप्त कर रहे कीटों की संख्या पर विचार करे, तो पिरामिड़ होगा-

(1) सीधा

(2) उल्टा

(3) घण्टाकार

(4) उपरोक्त सभी

150. मानव नर मे सहलग्न समूह होते है-

(1) 23

(2) 24

(3) 46

(4) 22

151. नीचे अरज्जुकी जीवों के विषय में कथन दिए गए हैं:
A. ग्रसनी क्लोम छिद्र से छिद्रित होती है
B. पृष्ठ रज्जु अनुपस्थित होता है
C. केन्द्रीय तंत्रिका तंत्र पृष्ठीय होता है
D. हृदय यदि उपस्थित होता है तो पृष्ठीय होता है
E. गुदा पश्च पुच्छ अनुपस्थित होती है
निम्न विकल्पों से सबसे सही उत्तर का चयन करो-

(1) केवल B, D तथा E

(2) केवल B, C तथा D

(3) केवल A तथा C

(4) केवल A, B तथा D

152. Assertion :- Lipases enzyme is produce by microbes and used in laundry.
Reason:- Used in detergent formulation for removing oily stains from the cloth.

(1) If both assertion and reason are true and reason is the correct explanation of assertion.

(2) If both assertion and reason are true but reason is not the correct explanation of assertion.

(3) If assertion is true but reason is false.

(4) If both assertion and reason are false.

153. Why it is necessary to conserve the wild life

(1) To protect the destroying wild animals

(2) To protect the ecosystem

(3) To safe guard the environment of earth

(4) All of the above

154. Match column-I with column-II and choose the correct combination from the options given below.

	Column-I		Column-II
(a)	Gaseous PGR	(i)	Auxin
(b)	Nutrient mobilisation	(ii)	Gibberellin
(c)	Used for killing dicot weeds	(iii)	Ethylene
(d)	Bolting in cabbage	(iv)	Cytokinin

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

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

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

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

155. Which is the first national park established in India

(1) Bandipur national park

(2) Corbett national park

(3) Kanha national park

(4) Periyar national park

152. कथन :- लाइपेज एंजाइम सुक्ष्मजीवो से निर्मित होता है तथा इसका उपयोग कपड़े धोने मे होता है
कारण :- कपड़ो से तैलीय दाग हटाने के लिए डिटर्जेंट (अपमार्जक) निर्माण में उपयोग किया जाता है।

(1) यदि कथन एवं कारण दोनों सत्य हैं तथा कारण कथन का सही स्पष्टीकरण है।

(2) यदि कथन एवं कारण दोनों सत्य हैं, लेकिन कारण, कथन का सही स्पष्टीकरण नहीं है।

(3) यदि कथन सत्य है, लेकिन कारण असत्य है।

(4) यदि कथन व कारण दोनों असत्य हैं।

153. वन्य जीवों को संरक्षित करना आवश्यक क्यों है-

(1) नष्ट होते हुए वन्य जीवों की सुरक्षा के लिए

(2) पारितंत्र की सुरक्षा के लिए

(3) पृथ्वी के पर्यावरण की रक्षा के लिए

(4) उपरोक्त सभी

154. कॉलम-I को कॉलम-II से सुमेलित करें और नीचे दिए गए विकल्पों में से सही संयोजन चुनें।

	कॉलम-I		कॉलम-II
(a)	गैसीय पादप वृद्धि नियामक	(i)	ऑक्सिन
(b)	पोषक तत्व संचरण	(ii)	जिबरेलिन
(c)	द्विबीजपत्री खरपतवार को नष्ट करने के लिए उपयोग किया जाता है	(iii)	एथीलिन
(d)	पत्तागोभी में बोल्टिंग	(iv)	साइटोकाइनिन

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

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

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

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

155. भारत में स्थापित पहला राष्ट्रीय उद्यान कौन सा है

(1) बांदीपुर राष्ट्रीय उद्यान

(2) कार्बेट राष्ट्रीय उद्यान

(3) कान्हा राष्ट्रीय उद्यान

(4) पेरियार राष्ट्रीय उद्यान

156. Find out the % of plants, which are dominant for both the character by the cross of $\frac{++}{ab}$ with it's recessive form, if 20% recombination is present:-

(1) 10

(2) 20

(3) 45

(4) 40

157. Identify the **correct** set of statements.
(a) Loose connective tissue has cells and fibres compactly arranged in a semi-fluid ground substance.
(b) Tendons attach skeletal muscles to bones.
(c) Chondrocytes are enclosed in small cavities within the matrix.
(d) All cells in epithelium are held together with the little intercellular material.
Choose the **correct** answer from the options given below.

(1) (a) and (b) only

(2) (a) and (d) only

(3) (a), (b) and (c) only

(4) (b), (c) and (d) only

158. Arrange microsporangial wall in sequence of outside to inside

(1) Epidermis, middle layer, endothecium, tapetum

(2) Epidermis, endothecium, middle layer, tapetum

(3) Epidermis, middle layer, tapetum, endothecium

(4) Endothecium, middle layer, tapetum, epidermis

159. Ribosomes are the site for

(1) Photosynthesis

(2) Protein synthesis

(3) Respiration

(4) Fat synthesis

156. जब $\frac{++}{ab}$ का क्रॉस उसके अप्रभावी स्वरूप से कराया जाता है यदि 20% पुनर्योजन उपस्थित है, तो इस क्रॉस से ऐसे पादपों की % क्या होगी, जिनमें दोनों प्रभावी लक्षण हो-

(1) 10

(2) 20

(3) 45

(4) 40

157. निम्न में से कथनों का **सही** समूह पहचाने -
(a) शिथिल संयोजी ऊतक में कोशिका एवं तंतु एक दूसरे से अर्द्धतरल आधारीय पदार्थ में सघन रूप से जुड़े रहते है।
(b) कंडराएं कंकाल पेशी को अस्थि से जोड़ती है।
(c) उपास्थि अणु आधात्री में छोटी गुहिकाओ में बंद हो जाते है।
(d) उपकला में सभी कोशिकाएँ अन्तरकोशिकीय पदार्थ से बंधी होती है।
नीचे दिये गये विकल्पो से **सही** उत्तर का चयन करे -

(1) केवल (a) तथा (b)

(2) केवल (a) तथा (d)

(3) केवल (a), (b) तथा (c)

(4) केवल (b), (c) तथा (d)

158. लघुबीजाणु भित्ति को बाहर से अंदर के क्रम में व्यवस्थित करें:-

(1) अधिचर्म, मध्य परत, अंतस्थीसियम, पोषक परत

(2) अधिचर्म, अंतस्थीसियम, मध्य परत, पोषक परत

(3) अधिचर्म, मध्य परत, पोषक परत, अंतस्थीसियम

(4) अंतस्थीसियम, मध्य परत, पोषक परत, अधिचर्म

159. राइबोसोम किसके लिए स्थल हैं

(1) प्रकाश संश्लेषण

(2) प्रोटीन संश्लेषण

(3) श्वसन

(4) वसा संश्लेषण

160. Statement I: DNA fingerprinting is highly reliable method of identification of individual involved in crimes.
Statement II: DNA fingerprinting is a sure method in solving paternity and maternity disputes.
Statement III: DNA fingerprinting can be used to cure HIV infection.

(1) All statements are correct

(2) Statement I and II is correct

(3) Statement I and III is correct

(4) Statement II and III is correct

161. Statement I: Frog have the ability to change the colour to hide them from their enemies (camouflage).
Statement II: They undergo summer sleep called as hibernation as well as winter sleep called as aestivation.

(1) Only Statement II is correct

(2) Only Statement I is correct

(3) Both Statement I and Statement II are incorrect.

(4) Both Statement I and Statement II are correct.

162. Select right answer for given pairs:-

	A	B
(I)	Hibiscus	Multicarpellary, Syncarpous
(II)	Papaver	Multicarpellary, Syncarpous
(III)	Michelia	Multicarpellary, Apocarpous
(IV)	Maize	Longest style

(1) All are correct

(2) All are correct except IV

(3) All are correct except III

(4) All are correct except II

163. Failure of cytokinesis after telophase stage of cell division results in an increase in a whole set of chromosomes in an organism, this phenomenon is called:-

(1) aneuploidy

(2) polyploidy

(3) tetraploidy

(4) all of these

160. कथन I: DNA फिंगरप्रिंटिंग अपराधों में शामिल व्यक्ति की पहचान की अत्यंत विश्वसनीय विधि है।
कथन II: DNA फिंगरप्रिंटिंग पैतृक और मातृक विवादों को हल करने में एक निश्चित विधि है।
कथन III: DNA फिंगरप्रिंटिंग का उपयोग HIV संक्रमण को ठीक करने के लिए किया जा सकता है।

(1) सभी कथन सही हैं

(2) कथन I और II सही हैं

(3) कथन I और III सही हैं

(4) कथन II और III सही हैं

161. कथन I: मेंढक में शत्रुओं से छिपने के लिए रंग परिवर्तित करने की क्षमता होती है (छलावरण)
कथन II: ये ग्रीष्म काल में निंद्रा में होते है जिसे शीतनिष्क्रियता कहा जाता है तथा शीत निंद्रा को ग्रीष्मनिष्क्रियता कहा जाता हैं।

(1) केवल कथन II सही है

(2) केवल कथन I सही है

(3) कथन I और कथन II दोनों गलत हैं।

(4) कथन I और कथन II दोनों सही हैं।

162. दिये गये युग्मों के लिए सही उत्तर का चयन कीजिए-

	A	B
(I)	गुड़हल	बहुअण्डपी, संयुक्ताण्डपी
(II)	पैपेवर	बहुअण्डपी, संयुक्ताण्डपी
(III)	माईचेलिया	बहुअण्डपी, वियुक्ताण्डपी
(IV)	मक्का	सबसे लम्बी वर्तिका

(1) सभी सही है।

(2) IV के अलावा सभी सही है।

(3) III के अलावा सभी सही है।

(4) II के अलावा सभी सही है।

163. कोशिका विभाजन के टीलोफेज चरण के बाद कोशिकाद्रव्य विभाजन की विफलता एक जीव में गुणसूत्रों के सम्पूर्ण समुच्चय में वृद्धि के परिणामस्वरूप होती है, इस घटना का कहा जाता है-

(1) एन्यूप्लॉइड़ी (असुगुणिता)

(2) पॉलीप्लॉइड़ी (बहुगुणिता)

(3) टैट्राप्लॉइड़ी (चर्तुगुणिता)

(4) यह सभी

164. Choose the correct set of diseases which spread by contaminated food and water:

(1) Filariasis, Ringworms

(2) Ascariasis, Amoebic dysentery

(3) Pneumonia, Typhoid

(4) Filariasis, Ascariasis

165. Which Pigment not involved in photosynthesis:-

(1) Chlorophyll

(2) Carotene

(3) Xanthophyll

(4) Anthocyanin

166. A typical angiospermous ovule is attached to the placenta by means of a stalk called X. Body of the ovule fuses with X in the region called Y.
Identify X and Y.

(1) Funicle, Hilum

(2) Hilum, Funicle

(3) Funicle, Micropyle

(4) Hilum, Chalaza

167. In a polypeptide chain 20 amino acid are present. How many total codons are present on mRNA which form this polypeptide chain:-

(1) 20

(2) 21

(3) 18

(4) 19

168. Mucus coating of epithelium lining the respiratory and gastro intestinal tract is an example of :

(1) Cellular barrier

(2) Physiological barrier

(3) Cytokine barrier

(4) Physical barrier

164. दूषित भोजन तथा जल से फैलने वाली बीमारियों के सही समूह को चुने:

(1) फाइलेरिऐसिस, दाद

(2) एस्केरिऐसिस, अमीबीय पेचिस

(3) न्यूमोनिया, टाइफोइड

(4) फाइलेरिऐसिस, ऐस्केरिऐसिस

165. कौन सा वर्णक प्रकाश संश्लेषण मे सम्मिलित नही है:-

(1) क्लोरोफिल

(2) कैरोटीन

(3) ज़ैंथोफिल

(4) एंथोसायनिन

166. एक विशिष्ठ एंजियोस्पर्म का बीजाण्ड एक वृंत के माध्यम से बीजांडासन से जुडा होता है जिसे X कहा जाता है। बीजाण्ड का काय एक स्थान में X के साथ जुड़ता है जिसे Y कहा जाता है।
X व Y को पहचाने -

(1) बीजाण्ड वृंत, नाभिका

(2) नाभिक, बीजाण्ड वृंत

(3) बीजाण्ड वृंत, बीजाण्डद्वार

(4) नाभिक, निभाग

167. एक पॉलीपेप्टाइड श्रृंखला में 20 अमीनो अम्ल उपस्थित है। इस पॉलीपेप्टाइड श्रृंखला को बनाने वाले mRNA में कुल कितने कोडोन उपस्थित होंगे-

(1) 20

(2) 21

(3) 18

(4) 19

168. श्वसन और जठरांत्र (gastro intestinal tract) संबंधी मार्ग को आस्तरित करने वाली उपकला का श्लेष्मीयआवरण एक उदाहरण है -

(1) कोशिकीय रोध

(2) कार्यिकीय रोध

(3) साइटोकाइन रोध

(4) शारीरिक रोध

169. Which of the following statements is false?

(1) Both the centrioles in a centrosome lie perpendicular to each other

(2) Centrioles form the basal body of spindle fibres only

(3) Each centriole has an organisation like that of a cartwheel

(4) Centrosome usually contains two cylindrical centrioles

170. Transcription is

(1) DNA synthesis

(2) RNA synthesis

(3) Protein synthesis

(4) Ribosome synthesis

171. Choose the mismatch w.r.t. cancer diagnosis:

(1) **Biopsy** – Histopathological studies for malignancy

(2) **Bone marrow test** – To detect leukemia

(3) **MRI** – Uses strong electric field and ionising radiations

(4) **Computed tomography** – Uses X–rays to generate 3–D image of organs

172. Meiosis differs from mitosis in that :

(1) It gives rise to four haploid cells

(2) It has two rounds of 's' phase

(3) It doesn't contribute to the variations

(4) More than one options are correct

173. DNA was proved to be genetic material through experiment of?

(1) Transduction

(2) Replica experiment

(3) Viral infection of Tobacco

(4) Transformation

174. Restriction enzymes were firstly isolated from-

(1) Haemophilus *influenzae*

(2) E. coli

(3) Pseudomonas *putida*

(4) Agrobacterium

169. निम्न में से कौनसा कथन गलत है-

(1) एक तारककाय में दोनों तारककेन्द्र एक दूसरे के लंबवत होते है।

(2) तारककेन्द्र केवल तर्कुतंतु की आधारी काय बनाता है।

(3) प्रत्येक तारककेन्द्र में बैलगाड़ी के पहिये के समान संगठन होता है।

(4) तारककाय में सामान्यतः दो बेलनाकार तारककेन्द्र होते है।

170. अनुलेखन है -

(1) डी. एन. ए. संश्लेषण

(2) आर. एन. ए. संश्लेषण

(3) प्रोटीन संश्लेषण

(4) राइबोसोम संश्लेषण

171. कैंसर निदान के संदर्भ में गलत मिलान का चयन करे:

(1) **बायोप्सी -** दुर्दमता के लिए ऊतक विकृति अध्ययन

(2) **अस्थि मज्जा परिक्षण -** अधिश्वेतरक्तता को पहचानने के लिए

(3) **MRI -** सबल विद्युत क्षेत्र तथा आयननकारी विकिरणो का उपयोग किया जाता है।

(4) **अभिकलित टोमोग्राफी -** X-किरणों का उपयोग करके किसी अंग के भीतरी भागों की त्रिविम प्रतिबिंब बनाती है।

172. समसूत्री विभाजन से अर्धसूत्री विभाजन भिन्न है क्योंकि-

(1) यह चार अगुणित कोशिकाओं को उत्पन्न करता है

(2) इसमें 's' अवस्था के दो चक्र होते हैं

(3) यह विविधताओं में योगदान नहीं देता है

(4) एक से अधिक विकल्प सही हैं

173. किस प्रयोग द्वारा DNA को आनुवंशिक पदार्थ सिद्ध किया गया?

(1) पारक्रमण

(2) प्रतिकृति प्रयोग

(3) तम्बाकू का वायरल संक्रमण

(4) परिवर्तन

174. रेस्ट्रीक्शन एन्जाइम को सबसे पहले किससे विलगित (अलग) किया-

(1) *हीमोफिलस इन्फ्लुएंजी*

(2) ई. कोलाई

(3) *स्युडोमोनास पुटिडा*

(4) एग्रोबैक्टीरियम

175. Leptotene, zygotene, pachytene, diplotene and diakinesis are 5 phases of prophase-I. Which one is longest in oocytes:-

(1) Zygotene

(2) Leptotene

(3) Diplotene

(4) Diakinesis

176. After completion of biosynthetic stage, the separation and purification of product is called:-

(1) Upstream processing

(2) Downstream processing

(3) Modern biotechnology

(4) Sterilization

177. Mitosis is significant for
(a) Growth
(b) Healing and regeneration
(c) Repair
(d) Maintenance of cell size

(1) Only (a) and (b)

(2) Only (c) and (d)

(3) Only (b) and (c)

(4) All (a), (b), (c) and (d)

178. Now a days it is possible to detect the mutated gene causing cancer by allowing radioactive probe to hybridise its complimentary DNA in a clone of cells, followed by its detection using autoradiography because-

(1) Mutated gene does not appear on photographic film as the probe has complimentarity with it.

(2) Mutated gene partially appears on a photographic film.

(3) Mutated gene completely and clearly Appears on a photographic film.

(4) Mutated gene does not appear on a photographic film as the probe has no complimentarity with it.

179. In which state of cell cycle, cell grows in size?

(1) G_1

(2) G_2 only

(3) S

(4) All of the above

175. लेप्टोटीन, ज़ाइगोटीन, पैकाइटीन, डिप्लोटीन और डाईकाइनेसिस प्रोफेज-I की 5 अवस्थाऐं हैं। इनमें से कौन सी अंड कोशिकाओं में सबसे लंबी होती है?

(1) ज़ाइगोटीन

(2) लेप्टोटीन

(3) डिप्लोटीन

(4) डाईकाइनेसिस

176. जैवसंश्लेषित चरण के पूरा होने के बाद, उत्पाद के पृथक्करण और शुद्धिकरण को कहा जाता है-

(1) प्रतिप्रवाह संसाधन

(2) अनुप्रवाह संसाधन

(3) आधुनिक जैव प्रौद्योगिकी

(4) जीवाणु नाशन/निर्जमीकरण

177. समसूत्री विभाजन किसके लिए महत्वपूर्ण है-
(a) वृद्धि
(b) उपचार और पुनःउत्पादन
(c) मरम्मत
(d) कोशिका आकार को बनाये रखना

(1) केवल (a) और (b)

(2) केवल (c) और (d)

(3) केवल (b) और (c)

(4) (a), (b), (c) और (d) सभी

178. कोशिकाओं के एक क्लोन में रेडियोधर्मी प्रोब से इसके DNA का संकरण कर और उसके बाद ऑटोरेडियोग्राफी प्रयुक्त कर इसकी पहचान कर कैंसर उत्पन्न करने वाली उत्परिवर्तित जीन का पता लगाना आजकल संभव है क्योंकि-

(1) उत्परिवर्तित जीन फोटोग्राफिक फिल्म पर नहीं आती क्योंकि प्रोब इसका पूरक होता है

(2) उत्परिवर्तित जीन फोटोग्राफिक फिल्म पर आंशिक रूप से आती है।

(3) उत्परिवर्तित जीन फोटोग्राफिक फिल्म पर पूर्ण और स्पष्ट रूप में आती है।

(4) उत्परिवर्तित जीन फोटोग्राफिक फिल्म पर नहीं आती क्योंकि प्रोब इसका पूरक नहीं होता है।

179. कोशिका चक्र की किस अवस्था में कोशिका आकार में वृद्धि करती है?

(1) G_1

(2) G_2 केवल

(3) S

(4) उपरोक्त सभी

180. Match the following column I and II on the basis of transfer of desire DNA in host cell :

	Column I		Column II
(a)	Direct method	(i)	Gene gun
(b)	Indirect method	(ii)	Microinjection
		(iii)	pBR322
		(iv)	Plasmid
		(v)	Disarmed pathogen

(1) a - i, ii b - iii,iv

(2) a - iii, v b - i, ii, iv

(3) a - ii, iii b - iv

(4) a - ii, iii, iv b - i, v

180. निम्नलिखित कॉलम I और II को परपोषी कोशिका में वांछित DNA के स्थानांतरण के आधार पर मिलाएं-

	कॉलम I		कॉलम II
(a)	प्रत्यक्ष विधि	(i)	जीन गन
(b)	अप्रत्यक्ष विधि	(ii)	सूक्ष्म अन्तः क्षेपण
		(iii)	pBR322
		(iv)	प्लास्मिड
		(v)	निष्क्रिय रोगजनक

(1) a - i, ii b - iii,iv

(2) a - iii, v b - i, ii, iv

(3) a - ii, iii b - iv

(4) a - ii, iii, iv b - i, v

SOLUTION

Physics

1. Answer: B

Sol:

$y = 10^{-4} \sin\left(600t - 2x + \frac{\pi}{3}\right)$

comparing with $y = A \sin (\omega t - kx + \phi)$

$\Rightarrow \omega = 600$

K =2.

$\therefore V = \frac{\omega}{K} = \frac{600}{2}$

$\therefore V = 300 \text{ m/s}.$

2. Answer: C

Sol:

Displacement $= \sum \text{area}$

$= 16 - 8 + 16 - 8 = 16 \text{ m}$

Distance$= \Sigma \mid \text{area} \mid = 48 \text{ m}$

$\frac{\text{displacement}}{\text{Distance}} = \frac{1}{3}$

3. Answer: B

Sol:

Suppose the mass of the particle is m and the spring constant of spring is k. The acceleration due to gravity at earth's surface is $g = \frac{GM}{R^2}$ with usual symbols. The extension in the spring is mg/k.

Hence, $1 \text{ cm} = \frac{GMm}{kR^2}$ ..... (i)

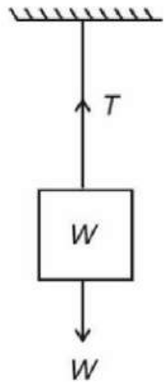
At a height h = 800 km, the extension is given by

$x = \frac{GMm}{k(R+h)^2}$....(ii)

x = 0.79 cm

4. **Answer:** A

Sol:



$$\text{Longitudinal stress} = \frac{\text{Internal restoring force}}{\text{Area}} = \frac{F_{ext}}{\text{Area}}$$

$$\text{Stress} = \frac{W}{A}$$

5. **Answer:** B

Sol:

Atoms have permanent magnetic moment which are randomly oriented i.e. in absence of external magnetic field the magnetic moment of whole material zero.

6. **Answer:** C

Sol:

We know that

$$\frac{T-T_{FP}}{T_{BP}-T_{FP}} = \text{const.}$$

$$\frac{C-0}{100-0} = \frac{F-32}{212-32}$$

$$C = \frac{5}{9}(F-32)$$

$$\Delta C = \frac{5}{9}\Delta F$$

$$40 = \frac{5}{9}\Delta F$$

$$\Rightarrow \Delta F = 72^{\circ}F$$

7. **Answer:** A

Sol:

Given:-

First overtone of a closed organ-pipe = Third harmonic of open organ pipe.

$$\frac{3V}{4l_C} = \frac{3V}{2l_0}$$

$$\Rightarrow \frac{l_C}{l_0} = \frac{1}{2}$$

8. Answer: C

Sol:

θ = 120 × 2π rad

t = 3 min

= 180 s

$\omega = \frac{\theta}{t}$

$= \frac{240\pi}{180}\text{rad/s} = \frac{4\pi}{3}$

$a_c = \omega^2 R$

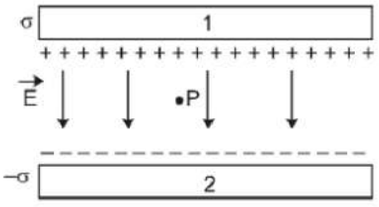
$= \frac{16\pi^2}{9} \times 9$

$= 16\pi^2 m/s^2$

9. Answer: C

Sol:

The situation is shown in the figure. Plate 1 has surface charge density σ and plate 2 has surface charge density σ. The electric field at point P due to charged plates add up, giving



$E = \frac{\sigma}{2\varepsilon_0} + \frac{\sigma}{2\varepsilon_0} = \frac{\sigma}{\varepsilon_0}$

Given,

$\sigma = 26.4 \times 10^{-12} C/m^2$

$\varepsilon_0 = 8.85 \times 10^{-12} N/m^2$

Hence, $E = \frac{26.4 \times 10^{-12}}{8.85 \times 10^{-12}} \approx 3 N/C$

10. Answer: C

Sol:

We know from stoke's Formula that Terminal velocity of a body in viscous fluid $F = 6\pi\eta r V_t$

also $V_t = \frac{2r^2(\rho - \sigma)}{9\eta}$

also heat developed(H) is due to the power requried to slow the body by the fluid

$\therefore P = F.V$

$P \propto rV_t^2 \propto r^5$

11. Answer: D

Sol:

$B_{axis} = \frac{\mu_0 niR^2}{2(R^2+x^2)^{3/2}}$

$B_{centre} = \frac{\mu_0 ni}{2R}$

At x = $\sqrt{3}R$

$B_{axis} = \frac{\mu_0 niR^2}{2(R^2+3R^2)^{3/2}} = \frac{\mu_0 ni}{16R}$

12. Answer: C

Sol:

According to stefan's Boltzmann law, the energy radiated per unit time:

$E = \sigma AT^4$

It is given that: $E = 5.67 \times 10^4$

Therefore, $5.67 \times 10^4 = 5.67 \times 10^{-8} \times 1 \times T^4$

So, $T = 1000K$

$T = 1000 - 273 = 727^\circ C$

13. Answer: A

Sol:

The equation of wave is form

$y = A\sin(kx - wt)$

As it is travelling from left to right

$\therefore v = \frac{dy}{dt} = Aw\cos(kx - wt)$

∴point of positive velocity are D,E and F

14. Answer: C

Sol:

The Force is given by

$F = \left|\frac{\Delta P}{\Delta t}\right| = \left|\frac{P_2 - P_1}{\Delta t}\right|$

$F = \left|\frac{m(v_2 - v_1)}{\Delta t}\right|$

$F = \left|\frac{0.15(0-20)}{0.1}\right|$

$F = 30N$

15. Answer: C

Sol:

Current, $I = \frac{V}{R}$ or $R = \frac{V}{I}$

Resistance of limiting resistor,

$R = \frac{(6-2)V}{10 \times 10^{-6} A} = 400\ k\Omega$

16. **Answer:** B

Sol:

In a circuit with a.c,source,choke coil which is essentially an inductor with high reactance, is used to decrease the current without loss of energy.No heat is generated so no loss of energy. When we use resistance to reduce current, there is loss of electrical energy in the form of heat generated

17. **Answer:** A

Sol:

$f = \frac{I_{max} - I_{min}}{I_{max} + I_{min}}$

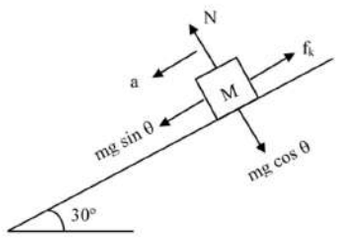
18. **Answer:** C

Sol:

Particles having phase difference of π will move with same speed

19. **Answer:** B

Sol:



$f_k = \mu N$

$N = mg\cos\theta$

$f_k = \mu mg\cos\theta$

$a = \frac{mg\sin\theta - \mu mg\cos\theta}{m}$

$a = g\sin 30^\circ - \mu g\cos 30^\circ$

$\frac{g}{4} = g\left[\frac{1}{2} - \frac{\sqrt{3}\mu}{2}\right]$

$\frac{1}{2} = 1 - \sqrt{3}\mu$

$\sqrt{3}\mu = \frac{1}{2}$

$\mu = \frac{1}{2\sqrt{3}}$

20. **Answer:** D

Sol:

For scientist A which goes down in a mine

$g' = g\left(1 - \frac{d}{R}\right)$

For scientist B, which goes up in the air

$g' = g\left(1 - \frac{2h}{R}\right)$

So it is clear that value of g measured by each will decrease at different rates.

21. Answer: B

Sol:

de-Brogli wavelength, $\lambda = \frac{h}{mv}$

As both particle and electron are having same wavelength, therefore their momentum will be equal.

$m_p v_p = m_e v_e$

$\Rightarrow v_p = \frac{m_e v_e}{m_p}$

$= \frac{9.1\times10^{-31}\times3\times10^{6}}{10^{-6}}$

$\Rightarrow v_p = 2.7 \times 10^{-18}\, ms^{-1}$

22. Answer: C

Sol:

f_1 = – 20cm

f_2 = 10cm

f = focal length of the combination

$\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$

$\Rightarrow \frac{1}{f} = \frac{1}{-20} + \frac{1}{10}$

$\Rightarrow \frac{1}{f} = \frac{-1+2}{20}$

$\Rightarrow$ f = 20cm.

Since power $\left(P\right) = \frac{100}{f(cm)}$

$\therefore \quad P = \frac{100}{20} = +5D$

23. Answer: B

Sol:

From energy conservation

$KE = P.E.$

$\frac{1}{2}I_{AOR}\omega^2 = Mgh_{cm}$

For solid Sphere

$\frac{1}{2}\left(\frac{1}{2}+1\right)mR^2\omega^2 = mgh_{cm} \ldots\ldots\ldots \left(!\right)$

For cylinder

$\frac{1}{2}\left(\frac{1}{2}+1\right)mR^2\omega^2 = mgh$ (cylinder)

$(1)/(2)$

$\therefore \frac{hs}{hc} = \left(\frac{14}{15}\right)$

24. Answer: B,

Sol:

At the highest point velocity is $u\cos\theta$.

$\therefore\ u\cos\theta = \frac{\sqrt{3}u}{2} \Rightarrow \cos\theta = \frac{\sqrt{3}}{2}$

$\Rightarrow \theta = 30^\circ$

$T = \frac{2u\sin 30^\circ}{g} = \frac{u}{g}$

25. Answer: A

Sol:

As we know, current density in the electron beam,

$f = \frac{I}{A} = \frac{ne}{t}/A = \frac{ne}{tA}$

substituting the values, we get

$f = \frac{7\times10^{16}\times1.6\times10^{-19}}{1\times2\times10^{-6}} = 5.6\times10^{3}\ Am^{-2}$

26. Answer: B

Sol:

Calculate B.E. per nucleon in both the cases.

27. Answer: C

Sol:

$C = \sin^{-1}\left(\frac{\mu_w}{\mu_g}\right) = \sin^{-1}\left(\frac{8}{9}\right)$

28. Answer: D

Sol:

Given angualr momentum (L) = $I\omega$;

Here I = moment of inertia

ω = angular velocity

Frequency (f) = $\frac{\omega}{2\pi} \Rightarrow \omega = 2\pi f$ .... (1)

Kinetic energy = $\frac{1}{2}I\omega^2 \Rightarrow I = \frac{2K}{\omega^2}$ ....(2)

Put (1) & (2) in angular momentum (L) = $I\omega$,

we get L = $\frac{K}{f\pi}$

$\therefore$ By using the condition given in the question

i.e., f ' = 2f, K' = $\frac{K}{2}$

L' = $\frac{K}{4f\pi}$

$\Rightarrow L' = \frac{L}{4}$

29. Answer: A

Sol:

Rectification efficiency is th ratio of DC output power to the AC input power, i.e.

$\eta = \frac{\text{DC output power}}{\text{AC input power}} \times 100$

Hrere, DC output power = 20 W

AC input power = 60 W

Rectification efficiency, $\eta = \frac{20}{60} \times 100 = 33.8\%$

30. Answer: D

Sol:

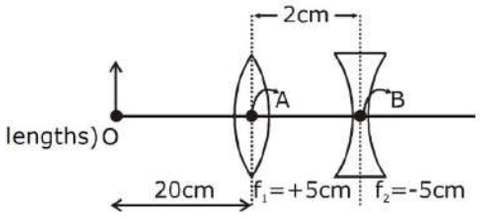
An accelerating charge produces an oscillating electric field. This oscillating electric field creates an oscillating magnetic field. This oscillating magnetic field then creates another oscillating electric field. This cycle of oscillating electric and magnetic fields keeps regenerating each other, producing EM waves and as electromagnetic (EM) waves, composed of oscillating electric and magnetic fields, do not transport electric charge themselves. They carry energy and momentum, but not charge.

Electromagnetic (EM) waves do not travel at the same speed in all media; they travel at the speed of light (approximately 3 x 10^8 m/s) only in a vacuum, and their speed decreases when passing through matter.

Therefore correct answer is option 4.

31. Answer: C

Sol:



For first lens,

$\frac{1}{v} - \frac{1}{-20} = \frac{1}{5}$

$v = \frac{20}{3}$

For second lens,

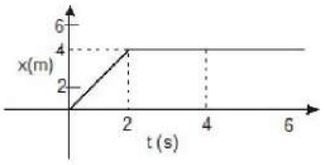
u = 20/3 − 2 = 14/3

So, 1/v − 3/14 = −1/5

hence, v = 70 cm

32. Answer: B

Sol:



Velocity of particle upto 2 sec (Just 2 second before)

$$= \frac{dx}{dt} = \frac{4}{2} = 2\ m/s$$

Velocity of particle Just after 2 sec = 0 .....(As slope is zero)

Change in momentum=Impulse

$$\Delta p = m[0 - 2]$$
$$\Delta\, p = 0.1 \times (-2)$$
$$\Delta p = -0.2\ kgm/s$$

33. Answer: B

Sol:

$$\frac{1}{C_{eq}} = \frac{1}{C} + \frac{1}{2C} + \frac{1}{4C} + \ldots \infty$$

$$= \frac{1}{C}\left[1 + \frac{1}{2} + \frac{1}{2^2} + \ldots . \infty\right]$$

$$= \frac{1}{C}\left[\frac{1}{1-\frac{1}{2}}\right] = \frac{2}{C}$$

The equivalent capacitance between A and B

$$C_{eq} = \frac{C}{2}$$

34. Answer: B

Sol:

$$\lambda = \frac{h}{\sqrt{2mk}} \Rightarrow \lambda \propto \frac{1}{\sqrt{m}}$$

35. Answer: B

Sol:

In YDSE the intensity is given by

$I_1 = 4I_0 \cos^2 \frac{\Delta\phi}{2}$

Case I

$\Delta x = 0, I_1 = 4I_0$

Case II

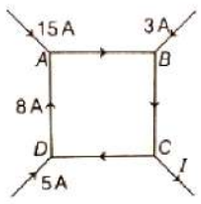
$\Delta x = \frac{\lambda}{4}$

$\Delta \phi = \frac{2\pi}{\lambda} \times \frac{\lambda}{4} = \frac{\pi}{2}$

$\Rightarrow I_2 = 4I_0 \cos^2 \frac{\pi}{4} = 2I_0 \frac{I_1}{I_2} = \frac{2}{1}$

36. Answer: C

Sol:



Applyin Kirchhoff's first law at juntion A,B, C, D

At A, $I_{AB} = 15 + 8 = 23$ A

At B, $I_{BC} = 23 + 3 = 26$ A

At D, $I_{CD} = 8 - 5 = 3$ A

At D, $I_{CD} + I = I_{BC}$

or 3 + I = 26

I = 23 A

37. Answer: B

Sol:

As area under curve A is maximum.

For constant volume the most work is done in isobaric process

38. Answer: B

Sol:

By theory

39. Answer: A

Sol:

Slope of isothermal process:-

$\frac{dP}{dV} = \frac{-P}{V}$

Slope of adiabatic process :-

$\frac{dP}{dV} = \frac{-\gamma P}{V}$

From given diagram curve C and D has a positive slope so they can not be the answer. Curve A has a greater slope than curve B so curve B must be adiabatic and in the adiabatic process no heat exchange.

40. Answer: C

Sol:

In case of first spring $F = k_1x_1$

$x_1 = \frac{F}{K_1}$ ...(1)

In case of second spring $F = K_2x_2$

$x_2 = \frac{F}{K_2}$ ...(2)

$\therefore K_1 > K_2 \Rightarrow x_2 > x_1$

$\Rightarrow$ More work is done by this force in case of second spring.

41. Answer: D

Sol:

In twisted wire, two halves each of resistance 2Ω are in parallel, so equivalent resistance will be $\frac{2}{2} = 1\Omega$.

42. Answer: D

Sol:

Given, $\vec{E} = E_0x^{3/2}\hat{i}\ V/m$

Electric field at x = 0

$E = E_0\ (0)$

$E = 0$

Again, Elctric field at x = a

$\vec{E} = E_0a^{3/2}\hat{i}\ V/m$

If side of cube is a, then surface area of the face is a^2 therefore,

$\Rightarrow \phi = E.dS$

$\Rightarrow \phi = E_0a^{3/2} \times a^2$

$\Rightarrow \phi = E_0a^{7/2}$

43. Answer: B

Sol:

Given

Percentage error in its each side = 2%

$\frac{\Delta a}{a} \times 100 = 2\%$

Volume of cube

$V = a^3$

Percentage error in volume of the cube is

$$\frac{\Delta V}{V} \times 100 = 3\left(\frac{\Delta a}{a} \times 100\right)$$

$$= 3 \times 2\%$$

44. Answer: D

Sol:

f_0 = 4 cm , f_e = 10 cm u_0 = − 5 cm

v_e = − D

for objective lens

$\frac{1}{v_0} - \frac{1}{u_0} = \frac{1}{f_0} \Rightarrow \frac{1}{v_0} - \frac{1}{-5} = \frac{1}{4}$

$\frac{1}{v_0} = \frac{1}{4} - \frac{1}{5} \Rightarrow \frac{1}{v_0} = \frac{5-4}{20}$

v_0 = 20 cm .....(i)

$M = \left[\frac{v_0}{|u_0|}\right] \times \left[1 + \frac{D}{f_e}\right] \Rightarrow M = \left[\frac{20}{-5}\right] \times \left[1 + \frac{25}{10}\right]$

M = − 4 × (3.5) ⇒ M = -14

45. Answer: D

Sol:

$\sin\theta$ is the ratio of sides of triangle, Hence dimensions cancel each other. So all the ratios are dimensionsless. Ex: Strain, Poision ratio, Refractive index. Hece dimension of $\sin\theta$ can be written as :

$[M^0 L^0 T^0]$

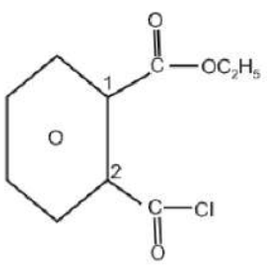
46. Answer: C

Sol:

$$\underset{\text{cupric}}{Cu^{2+}} \quad \underset{\text{metaborate}}{BO_2^- \rightarrow} \quad Cu(BO_2)_2$$

47. Answer: C

Sol:



Ethyl 2-(Chloro-carbonyl) benzene-carboxylate

48. Answer: B

Sol:

Molarity depends on temperature.

Molarity includes volume of solution which can change with change in temperature.

49. Answer: D

Sol:

$$\Delta U = q + w$$

$$= 200J - 0.5\ atm(6-2)$$

$$= 200J - 2L\ atm$$

$$= 200J - 2 \times 101.3\ J (1L\ atm = 101.3J)$$

$$= -2.6J$$

50. Answer: C

Sol:

$$\frac{P^o - P^o \times \frac{4}{5}}{P^o} = X_{solute}$$

$$\frac{1}{5} = \frac{w/60}{\frac{w}{60} + \frac{180}{18}}$$

w=150 g

51. Answer: D

Sol:

The energy of 2s orbitals is less than that of 2p orbitals in the case of hydrogen-like atoms. For Hydrogen like atoms which have single electron, energy of orbitals depend only on their principal quantum number, as there is no influence of other electrons like in multielectronic systems.
The energy of 2s orbital is less than the energy of 2p orbital in case of hydrogen like atoms, hence this statement is incorrect.

52. Answer: A

Sol:

$C_2H_4(g)+H_2(g)\rightarrow C_2H_6(g)$

$\Delta_r H = \sum BE_R - \sum BE_P$

$= BE_{C=C}+4BE_{C-H}+BE_{H-H}-BE_{C-C}-6BE_{C-H}$

$= 600+4\times410+400-350-6\times410$

$= -170$ KJ/mol

53. Answer: D

Sol:

Method-1

Given that

$W_{solute} = 1.25\ g$

$W_{solvent} = 20\ g$

$\Delta T_f = T_f - T_f' = 273 - 271.94 = 1.06K$

$K_f = 1.86\ K\ kg\ \ mol^{-1}$

We know,

$MW_{solute} = \frac{K_f \times W_{solute} \times 1000}{\Delta T_f \times W_{solvent}}$ ..... (1)

Put all the values in equation (1)

$MW_{solute} = \frac{1.86\times1.25\times1000}{1.06\times20}$

$= 109.66\ g/mole$

Method-2

$\Delta T_f = K_f \times \frac{W_{solute}\times1000}{M_{wt\ solute}\times W_2}$

$1.06 = \frac{1.86\times1.25\times1000}{W_{wt}\times20}$

$W_{wt} = \frac{1.86\times1.25\times1000}{1.06\times20}$

$W_{wt} = 109.66\ gm$

54. Answer: B

Sol:

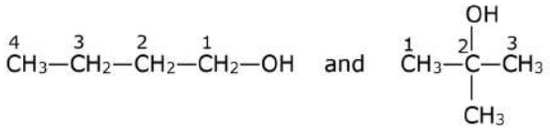
(1) In $SiCl_4$, silicon has vacant d-orbitals which can be used for hydrolysis. Hence $SiCl_4$ can undergo hydrolysis.

(2)Under normal circumstances, carbon tetrachloride (CCl_4) is not hydrolyzed. This is because the lack of d-orbitals in carbon, which prevents it from forming five-coordinated.

(3) $BeCl_2.xH_2O$ can undergo hydrolysis because Be has vacant p orbital and electron deficient centre.

55. Answer: A

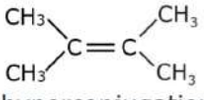
Sol:



Chain isomers

56. Answer: C

Sol:



has highest C=C bond length (B.L.) because it has maximum hyperconjugation as it contains four methyl groups. More single bond character by hyperconjugation.

57. Answer: B

Sol:

The reduction half reaction is

$\overset{+7}{M}nO_4^- \longrightarrow Mn^{2+}$ ..... (1)

The oxidation half reaction is

$\overset{+3}{C_2}O_4^{2-} \longrightarrow \overset{+4}{C}O_2$ ..... (2)

Atoms other than H & O are balanced

$MnO_4^- \longrightarrow Mn^{2+}$

$C_2O_4^{2-} \longrightarrow 2\,CO_2$

Balanced O atoms by the addition of H_2O

$MnO_4^- \longrightarrow Mn^{2+} + 4H_2O$

$C_2O_4^{2-} \longrightarrow 2\,CO_2$

Balanced H atoms by the addition of H^+ ion

$MnO_4^- + 8H^+ \longrightarrow Mn^{2+} + 4H_2O$

$C_2O_4^{2-} \longrightarrow 2\,CO_2$

Balancing the charge by the addition of e^-

$MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{2+} + 4H_2O \Big] \times 2$

$C_2O_4^{2-} \rightarrow 2\,CO_2 + 2e^- \Big] \times 5$

$2\,MnO_4^- + 16H^+ + 10e^- \rightarrow 2\,Mn^{2+} + 8H_2O$

$5C_2O_4^{2-} \longrightarrow 10\,CO_2 + 10e^-$

$2\,MnO_4^- + 5C_2O_4^{2-} + 16H^+ \rightarrow$

$2\,Mn^{2+} + 10\,CO_2 + 8H_2O$

58. Answer: B

Sol:

$C_t = \frac{C_0}{(2)^n}$

$(2)^n = \frac{800}{50} = 16$

$(2)^n = (2)^4$

$So, n = 4$

$4T_{1/2} = 200 \text{ sec}$

$T_{1/2} = 50 \text{ sec}$

$K = \frac{0.693}{T_{1/2}} = \frac{0.693}{50} = 1.386 \times 10^{-2} \text{ sec}^{-1}$

59. Answer: A

Sol:

$m = \frac{\frac{1.1}{267.5}}{0.1} = 0.04112 \text{ mol / kg}$

$\Delta T_f = iK_f m$

0.306=i×1.86×0.04112

4=i

60. Answer: D

Sol:

DMG + $NiCl_2$ + NH_4OH → Red ppt (excess)

61. Answer: D

Sol:

By theory

62. Answer: C

Sol:

Nitrobenzene does not give Friedel crafts reaction.

63. Answer: A

Sol:

$\log \frac{K_2}{K_1} = \frac{E_a}{2.303R}\left(\frac{T_2 - T_1}{T_1 T_2}\right)$

$\log 2 = \frac{E_a}{2.303 \times 8.314} \times \frac{10}{298 \times 308}$

E_a = 52.89 kJ

64. Answer: A

Sol:

Fact

65. Answer: D

Sol:

$$\propto = \sqrt{\frac{K_a}{C}} = \sqrt{\frac{10^{-5}}{10^{-1}}} = 10^{-2}$$

66. Answer: D

Sol:

I, IV

67. Answer: B

Sol:

$$CH_3CHO \xrightarrow{Na/C_2H_5OH} CH_3CH_2OH$$

Acetaldehyde Ethylalcohol

68. Answer: A

Sol:

$$1.1 \times 96500 \times 2 = 212.30 \text{ kJ}$$

69. Answer: A

Sol:

$[Pt(NH_3)_2Cl_2]$ so NH_3 & Cl

70. Answer: A

Sol:

$$C_6H_5CHO + CH_3COC_6H_5 \xrightarrow[-H_2O]{NaOH} \underset{\text{Benzyl acetophenone}}{C_6H_5 - CH = CH - \overset{\overset{O}{\|}}{C} - C_6H_5}$$

71. Answer: C

Sol:

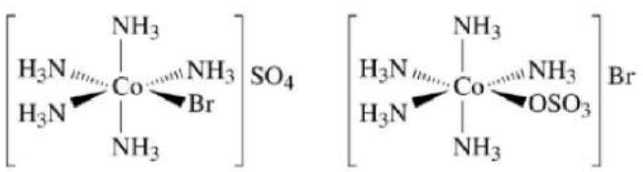
The reduction potential of D (−0.402V) is minimum. So that oxidation potential of D(+0.402) is maximum. D can oxidize itself and reduce others. The aqueous solution A will be present in its ionic form and can be reduced by D because A(−0.250) reduction potential is higher than D(−0.402).

72. Answer: C

Sol:

$[Co(NH_3)_5Br]SO_4$ & $[Co(NH_3)_5SO_4]Br$ **are ionisation isomers.**

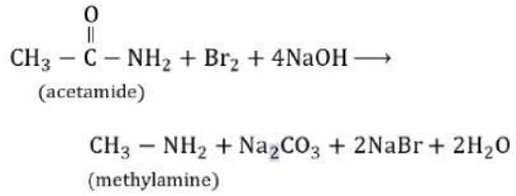
Here there is replacement between the Br^- and SO_4^{2-}, hence we will get two isomers.



This is not possible in other compounds.

73. Answer: B

Sol:

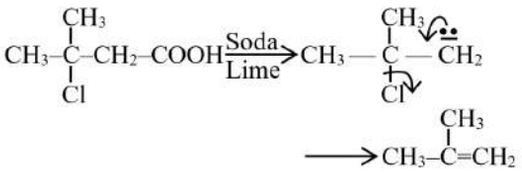


(acetamide)

(methylamine)

74. Answer: B

Sol:



75. Answer: D

Sol:

Kohlrausch's law states that the equivalent conductivity of an electrolyte at infinite dilution is equal to the sum of the conductances of the anions and cations.

$A_2B \rightarrow 2A^+ + B^-$

$$\lambda^{\infty}_{A_2B} = 2\lambda^{\infty}_{(A^+)} + \lambda^{\infty}_{(B^{2-})}$$

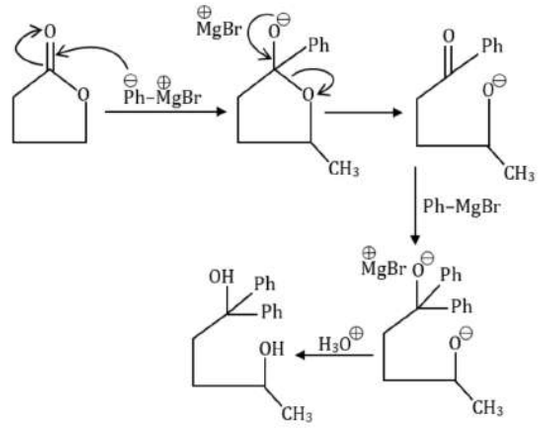
76. Answer: A

Sol:

N_2^+ is more stable than N_2^-.

77. Answer: A

Sol:



78. Answer: C

Sol:

According to Le Chatelier's principle adding heat to a solid and liquid in equilibrium with endothermic nature will cause the mass of solid to decrease.

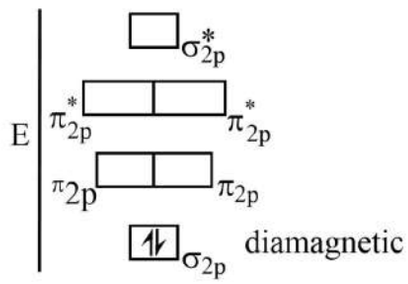
Solid $\rightleftharpoons$ Liquid; ΔH = +ve

Increase in temperature favours forward reaction. In endothermic reactions, (ΔH = +ve) heat is absorbed with the reactants. It means more energy is needed to overcome the forces of attraction between molecules and to separate them from one another than the energy gained when new bonds are formed.

79. Answer: A

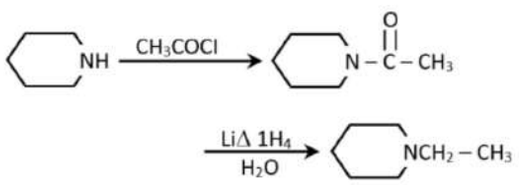
Sol:

of 2s-2p mixing is not done, then molecule follow following arrangement.



80. Answer: B

Sol:



81. Answer: B

Sol:

	List-I (Molecules)		List-II (Correct observation Considering Molecular Orbital Theory)
P	O_2	A	Maximum unpaired electron
Q	N_2	D	s-p mixing
R	F_2	B	No multiple bond
S	O_2^+	C	Odd electron species

82. Answer: C

Sol:

Organic compounds containing both N and S give blood red colour in Lassaigne test due to the formation of $Fe(SCN)_2$

Thus, $H_2N(C_6H_4)SO_3H$ gives blood red colour in Lassaigne.s test of nitrogen.

83. Answer: B

Sol:

S.N= σ+lp

For $TeCl_4 \Rightarrow$ S.N. = 4+1

=5

So, sp^3d hybridisation

84. Answer: A

Sol:

Drago's molecule $(\approx 90^{\circ})$

85. Answer: A

Sol:

Vitamin E is fat soluble and present in sunflower oil. Its deficiency increases muscular weakness.

86. Answer: C

Sol:

Br^- is replaced by I^- through SN_2 reaction mechanism. F^- is bad leaving group. So It is not replaced.

87. Answer: C

Sol:

Down the group, the electron density on central atom decreases and consequently its tendency to donate a pair of electron decreases and hence its basic strength decrease as we move from NH_3 to SbH_3.

Therefore the correct order is $NH_3 > PH_3 > AsH_3 > SbH_3$

88. Answer: C

Sol:

related to be element.

89. Answer: B

Sol:

The given electronic configuration are of N, Na, Ne, F respectively out of these, Na has the lowest I.E.

90. Answer: A

Sol:

For isoelectronic species ionic radii is directly proportional to magnitude of negative charge and indirectly

91. Answer: C

Sol:

Social animals are those animals which interact highly with other animals, usually of their own species, to the point of having a recognizable and distinct society. In the case of social animals, not having those social interactions can be detrimental to the animal's development; they are crucial. Social insects such as ants, bees, termites, and wasps are the main species known to have developed caste systems. In the colony of these insects, all animals follow a particular social order with a clear-cut differentiation of the functions each type is expected to perform. For example, some animals will be workers and soldiers and few will be specialised for reproduction.

92. Answer: B

Sol:

When complete stamens or only anther are attached to gynoecium is known as gynandrous. For example: Calotropis.

When stamens are attached to petals is known as epipetalous.

When stamens are attached to tepals is known as epiphyllous.

Hence, the correct answer is **Gynandrous**.

93. Answer: A

Sol:

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94. Answer: C

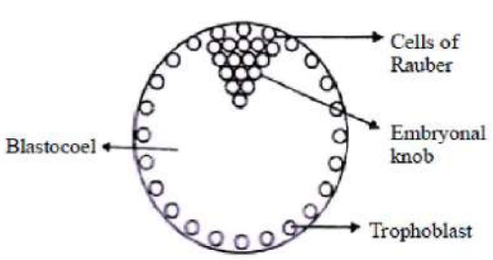
Sol:

Both A and B statements are correct

95. Answer: C

Sol:

The blastocyst is a structure formed in the early development of mammals. The blastomeres in the blastocyst are arranged into an outer layer called trophoblast and an inner group of cells attached to trophoblast called the inner cell mass. The trophoblast layer then gets attached to the endometrium and the inner cell mass gets differentiated as the embryo.



[Blastocyst]

96. Answer: D

Sol:

The **living organisms are considered as self replicating, evolving and self regulatory** interactive systems capable of responding to external stimuli.

They **exhibit properties** such as metabolism,growth and consciousness etc..

all living organisms are linked to one another because they share **common genetic material i.e. DNA and RNA** but it can vary to some degrees.

97. Answer: D

Sol:

Both (2) and (3)

98. Answer: C

Sol:

Active binding sites for myosin on the actin filaments

99. Answer: D

Sol:

In liliaceae, flower is actinomorphic and axile placentation with many ovule.

100. Answer: A

Sol:

The rapid increase in numbers of a particular species, especially in the world's human population since the end of World War II, attributed to an accelerating birthrate, a decrease in infant mortality, and an increase in life expectancy. Poverty is believed to be the leading cause of overpopulation. A lack of educational resources, coupled with high death rates leading to higher birth rates, result in impoverished areas seeing large booms in population. Overpopulation pollutes the Earth and takes a lot of natural resources. It is also the driving force for global warming, environmental pollution, habitat loss, mass extinction, and intensive farming practices.

101. Answer: A

Sol:

As the solubility of CO_2 is 20-25 times higher than that of O_2, the amount of CO_2 that can diffuse through the diffusion membrane per unit difference in partial pressure is much higher compared to that of O_2.

102. Answer: C

Sol:

Removed during the maturation of pro-insulin to insulin

103. Answer: C

Sol:

The placenta works as an endocrine gland to supply the hormones for a healthy pregnancy.

The placenta is a fetomaternal organ ie., Chorion (fetal placenta) + Maternal placenta.

Hence, the statement which states that placenta formation is done only by maternal tissue is wrong.

Hence, the correct option is "3" - Placenta formation is done only by maternal tissue.

104. Answer: A

Sol:

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105. Answer: C

Sol:

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106. Answer: C

Sol:

Duration during which a nerve is not able to conduct another impulse after the conduction of one is called absolute refractory period.

The refractory period is a period during which a nerve or muscle is incapable of responding to stimulation immediately following a previous stimulation.

107. Answer: D

Sol:

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108. Answer: B

Sol:

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During **joint diastole**, all four chambers of the heart—the **right atrium, left atrium, right ventricle, and left ventricle**—are in a **relaxed state**. This is the resting phase of the cardiac cycle, allowing the heart to fill with blood. At this stage, the **tricuspid (right atrioventricular) and bicuspid (mitral or left atrioventricular) valves** are **open**, permitting blood to flow passively from the atria into the ventricles. Meanwhile, the **semilunar valves (pulmonary and aortic valves)** remain **closed** to prevent backflow of blood from the pulmonary artery and aorta into the ventricles. This phase ensures efficient blood circulation by preparing the ventricles for the next contraction (systole). Since the opening and closing of these valves regulate proper blood flow, the reason correctly explains the assertion, making both statements true.

109. Answer: C

Sol:

Assertion: RNAi involves silencing of a specific mRNA due to complementary dsRNA that binds to and prevents translation of the mRNA.

- **True.** RNA interference (RNAi) is a process in which double-stranded RNA (dsRNA) leads to the degradation or blocking of target mRNA, preventing translation.

Reason: RNAi takes place in all prokaryotic organisms as a method of cellular defense.

- **False.** RNAi is primarily found in **eukaryotic organisms** (e.g., plants, animals, fungi). Prokaryotes do not have RNAi.

110. Answer: B

Sol:

The ovulation in human females takes place in the ovulatory phase which takes place at the end of the follicular phase or proliferative phase.

It takes place on the 14th day of menstrual cycle.

Hence, the correct option is "2" - At the end of the follicular phase.

111. Answer: C

Sol:

Members of Cyanobacteria like *Nostoc* and *Anabaena* have the ability to fix atmospheric nitrogen in cells known as heterocysts.

112. Answer: D

Sol:

A stationary population is a special example of a stable population with a zero growth rate, neither growing nor shrinking in size, and is equivalent to a life table population.By definition, stable populations have age-specific fertility and mortality rates that remain constant over time. Stable populations with positive growth rates ($r>0$) grow steadily over time, negative growth rates ($r<0$) imply that the population is shrinking steadily.

113. Answer: A

Sol:

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114. Answer: B

Sol:

Class11th NCERT Page No. 236

115. Answer: A

Sol:

In the dicot stem, the vascular bundles are arranged in a ring, with pith concentrated at the core of the stem, rather than being scattered throughout the plant interior. In dicot stem wedge shaped, definite and arranged in one or two rings. Vascular bundles are conjoint, collateral and open.

116. Answer: C

Sol:

Blood is made up of 55% plasma and 45% formed elements—red blood cells, white blood cells, and platelets. Blood is fluid connective tissue that circulates throughout the body.

Formed Elements consist of Erythrocytes (red blood cells that function in oxygen transport), Leukocytes (white blood cells that function in immunity), and Platelets (cell fragments that function in blood clotting).

Erythrocytes (red blood cells) Erythrocytes, or red blood cells, are the most numerous of the formed elements.

Normal red blood cells values at various ages are: Newborns: 4.8 - 7.2 million. Adults: (males): 4.6 - 6.0 million. (Females): 4.2-5.0 million.

The spleen plays an important role in the red blood cells also known as aserythrocytes and the digestive system. Old and damaged RBC's are destroyed in the spleen and It is known as the RBCs Graveyard.

117. Answer: D

Sol:

India has rich cultural and traditional heritage that includes spices, medicinal plants, biological pesticides and agricultural which is diversed.

Indian plants that have been either patented or attempts have been made to patent them by western nations for their commercial use includes black pepper, basmati rice, Indian mustard, Turmeric, neem, Pomegranate.

U.S, Germany, Japan are the main countries that have attempted for patenting these plants for their own country's benefits.

Hence, the correct answer is option "4" - All of the above have been targetted.

118. Answer: C

Sol:

A venereal disease involving inflammatory discharge from the urethra or vagina. Gonorrhoea is a sexually transmitted infection (STI).

Hepatitis B is a serious infection of the liver caused by a virus. Hepatitis B is a sexually transmitted disease that has a safe and effective vaccine to protect against infection.

Chlamydia is transmitted through sexual contact with the penis, vagina, mouth, or anus of an infected partner. Ejaculation does not have to occur for chlamydia to be transmitted or acquired.

119. Answer: B

Sol:

A, B and D

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120. Answer: B

Sol:

Natality in **population ecology** is the scientific term for birth rate. **Natality** is the number of births during a given time period in a **population** that are **added** to the **initial density.** An increase in the number of individuals in a population under given environmental conditions can be due to **natality and immigration. Natality** is the greatest influence on a **population's increase.**

The **natality rate** (or **birth rate**) could be **calculated precisely** by **dividing the number of births** by the total time at **risk of giving birth** among **all individuals.**

121. Answer: D

Sol:

Joseph Priestley (1733-1804) performed a series of experiments in 1770 and 1772 using a bell jar, a candle, a mouse, and a mint plant to demonstrate the role of air in the growth of green plants and the presence of oxygen gas.

In 1897, Theodor Wilhelm Engelmann conducted an experiment using Cladophora algae to study the action spectrum of photosynthesis.

In 1931, microbiologist Cornelius van Niel conducted experiments on purple and green sulfur bacteria to study photosynthesis.

Calvin and his colleagues used the unicellular green alga Chlorella and Scenedesmus to study the carbon-assimilation reactions of photosynthesis.

122. Answer: A

Sol:

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123. Answer: A

Sol:

In a young dicot stem, the cambium is single layered. It is made by the intrafascicular cambium present within the vascular bundles and the dedifferentiation of the parenchyma cells of the medullary rays between the vascular bundles, called interfascicular cambium. Their combination gives a circular cambium that produces xylem elements on the inner side and the phloem elements on the outer side.

124. Answer: C

Sol:

Blood enters glomerulus through efferent arterioles

125. Answer: D

Sol:

Lecithin is a phospholipid which consists of glycerol , two fatty acids , a phosphate group and choline.

Glycerol, also known as glycerin, is a trihydroxy propane lipid. It is made up of three hydroxyl groups attached to three carbons of propane.

Lipids having only single bonds are called saturated fatty acids and lipids having one or more C = C double bonds are called unsaturated fatty acids.

Palmitic acid has 16 carbon atoms including carboxyl carbon.

Arachidonic acid has 20 carbon atoms including the carboxyl carbon.

126. Answer: C

Sol:

In biology, **saltation** is a sudden and large mutational change from one generation to the next, potentially causing single-step speciation. This was historically offered as an alternative to Darwinism.

The term is used for non-gradual changes (especially single-step speciation) that are atypical of, or gradualism - involved in modern evolutionary theory. It was popular with early geneticists such as Hugo de Vries, William Bateson and Thomas Hunt Morgan.

127. Answer: A

Sol:

Fusion of protoplasms between two motile or non-motile gametes called **plasmogamy**.

Fusion of two nuclei called **karyogamy**. **Cytokinesis** is the division of the cytoplasm.

128. Answer: C

Sol:

A large population of insects feeds upon a very big tree. The insects, in turn, are eaten by small birds which in turn are fed upon by big birds. It showing the interaction between trees, insects, birds and big birds. Pyramid of number is spindle-shaped as the number of insects is maximum. The number of trees and birds are less than the insects. The number is gradually decreasing at each trophic level.

129. Answer: C

Sol:

During aerobic respiration, O_2 is consumed and CO_2 is released. The ratio of the volume of CO_2 evolved to the volume of O_2 consumed in respiration is called the respiratory quotient (RQ) or respiratory ratio.

$$RQ = {Volume\ of\ CO_2}/{Volume\ of\ O_2}$$

For example –

When carbohydrates are used as substrate and are completely oxidised, the RQ will be 1, because equal amounts of CO_2 and O_2 are evolved and consumed, respectively.

When fats are used in respiration, the RQ is less than 1.

When proteins are respiratory substrates the ratio would be about 0.9.

130. Answer: A

Sol:

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131. Answer: C

Sol:

Pure breeding parents mean that the plant will always make offspring like itself when self-fertilized over many generations. If parents are not pure breeding, we can not be sure about the genotype of the parent before cross i.e. the character it is showing is due to homozygous or heterozygous genotype.

If parents are not pure breeding, no matter up to how many generations we cross plants offspring will be produced randomly with phenotypes that can not be predicted by Mendel's laws.

So, the correct option is 'Parents are pure breeding'.

132. Answer: A

Sol:

Protonephridia or flame cells are the excretory structures in Platyhelminthes.

Nephridia are the tubular excretory structures of earthworms and other annelids. It help to remove nitrogenous wastes and maintain a fluid and ionic balance.

Malpighian tubules are the excretory structures of most of the insects including cockroaches. It help in the removal of nitrogenous wastes and osmoregulation.

Antennal glands or green glands perform the excretory function in crustaceans like prawns.

133. Answer: D

Sol:

Platyhelminthes are bilaterally symmetrical, triploblastic and acoelomate animals with **organ level of organisation**.

Bilateral symmetry (body can be divided into 2 equal halves) is the **most common** found in Animals like annelids, arthropods, etc.

The body cavity is not lined by mesoderm, instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm. Such a body cavity is called **pseudocoelom** and the animals possessing them are called pseudocoelomates, e.g., **aschelminthes**

Platyhelminthes are **triploblastic animals** but they dont posses true coelom and are **acoelomates**.

Body cavity of **arthropoda** around viscera contain blood and the coelom filled with blood is called the **haemocoel**.

134. Answer: A

Sol:

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135. Answer: D

Sol:

In spirogyra, all the cells of the filament can form the gametes, which are morphologically similar and are referred to as isogametes. This phenomena of sexual reproduction are known as isogamous type of sexual reproduction. But at the time of conjugation one of the two isogametes shows motility and is considered as the male gamete. This phenomenon is referred to as physiological an isogamy, as they show dissimilar physiological function.

Oogamous, relating to or denoting reproduction by the union of mobile male and immobile female gametes.

Cleistogamy is a type of automatic self-pollination of certain plants that can propagate by using non-opening, self-pollinating flowers. Especially well known in peanuts, peas, and pansy this behaviour is most widespread in the grass family.

Isogamous is a type of sexual reproduction in which male and female gametes have similar morphology. They have similar shape and size.

136. Answer: D

Sol:

Based on the source of their nutrition or food, organisms occupy a specific place in the food chain that is known as their **trophic level**.

Producers belong to the first trophic level, herbivores (primary consumer) to the second and **carnivores (secondary consumer) to the third**

The important point to note is that the amount of energy **decreases at successive trophic levels**. The number of trophic levels in the grazing food chain is restricted as the transfer of energy follows **10 per cent law** – only 10 per cent of the energy is transferred to each trophic level from the lower trophic level.

Therefore, tiger at the apex will be at highest trophic level and lower enegy will be available. Hence the **correct** option is **D**

137. Answer: A

Sol:

Plants do not have a dedicated respiratory system or circulatory system, but they do breathe in and out oxygen and carbon dioxide because they have lenticels and stomata for gases exchange. The cells in the interior are dead and provide only mechanical support. Thus, most cells of a plant have at least a part of their surface in contact with air. This is also facilitated by the loose packing of parenchyma cells in leaves, stems and roots, which provide an interconnected network of air spaces.

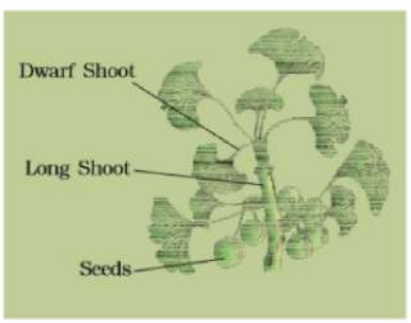
138. Answer: B

Sol:

Insulin is a hormone made by an organ located behind the stomach called the pancreas. There are specialised areas within the pancreas called islets of Langerhans while other are derived from cholesterol.

139. Answer: D

Sol:



Given image is of Ginkgo,

A=Dwarf shoot,

B=Long shoot,

C= Seeds

140. Answer: A

Sol:

More than two alternate forms of a gene present on the same locus are called multiple alleles and the mode of inheritance in these alleles is called multiple allelism.

Humans are diploid organisms and they possess two alleles of a particular gene but they exist at the population level also..

141. Answer: A

Sol:

In DCT, conditional reabsorption of Na+ and water takes place. It is also capable of reabsorption of HCO_3^- and selective secretion of hydrogen and potassium ions and NH_3 to maintain the pH and sodium-potassium balance in blood.

Collecting Duct is long duct extends from the cortex of the kidney to the inner parts of the medulla. It allows passage of small amounts of urea into the medullary interstitium to keep up the osmolarity. It also plays a role in the maintenance of pH and ionic balance of blood by the selective secretion of H^+ and K^+ ions.

142. Answer: B

Sol:

Both **(A)** and **(R)** are true but **(R)** is not the correct explanation of **(A)**

143. Answer: C

Sol:

An **ecological pyramid** is a graphical representation showing the relationship between different organisms in an ecosystem.

The **three types** of ecological pyramids that are usually studied are (a) **pyramid of number**; (b) **pyramid of biomass** and (c) **pyramid of energy**.

The **pyramid of biomass in sea** is generally **inverted and a**n inverted n**umber pyramid is found in parasitic food chains**.

144. Answer: B

Sol:

Leaf abscission is associated with an increase in ethylene production by petiole cells. Ethylene is a plant hormone known to promote abscission by inducing the formation of the abscission zone. This option accurately describes a key aspect of the abscission process.

Leaf senescence, which is the aging and eventual death of a leaf, typically precedes abscission.

Abscisic acid is involved in stress responses and stomatal closure rather than directly regulating abscission.

Abscission is an active process involving the formation of an abscission zone where cells actively separate.

145. Answer: A

Sol:

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146. Answer: C

Sol:

The relative growth of leaf A is higher than that of leaf B. The absolute growth rate is the total growth per unit time. In this case, the absolute growth rate for both leaves is 5 square centimetres per hour.
Relative growth is the rate of growth with respect to the initial size. Here, the relative growth rate for leaf A is higher because its surface area increased by 100%, while that of leaf B increased by only 10%.

147. Answer: C

Sol:

Cockroach, Scorpion, Spider, Belongs to the phylum arthropoda, they have a circumenteric ring and a double, solid, midventral nerve cord.

148. Answer: A

Sol:

A, B, D

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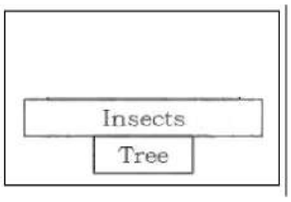
149. Answer: B

Sol:

Depending upon the given data, an inverted -shaped pyramid could be observed. This indicates the pyramid of numbers. In this, the number of the tree will remain only one. However, the number of insects will be in a large number.



150. Answer: B

Sol:

24

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151. Answer: A

Sol:

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Non- chordates	Chordates
Gill slits are absent	Pharynx is perforated by gill slits.
Notochord is absent	Notochord is present
Central nervous system is ventral.	Central nervous system is dorsal.
Heart is dorsal if (present)	Heart is ventral
Post anal tail is absent	Post anal tail is present

152. Answer: A

Sol:

Microbes are used for production of enzymes such as lipases which are used in detergent formulations and are helpful in removing oily stains from the laundry.

153. Answer: D

Sol:

Conservation of wild life is necessary because:

We are **preserving and protecting** wild plants, animals, and their habitats to **protect vanishing wild animals.**

To protect the **ecosystem**, greater species diversity ensures **natural sustainability** for all life forms.

To **safeguard** the environment of the earth, healthy ecosystems can better withstand and recover from a **variety of disasters.**

154. Answer: D

Sol:

Ethylene is a simple gaseous PGR. It promotes female flowers in cucumbers thereby increasing the yield.

2, 4-D is a synthetic auxin, widely used to kill dicotyledonous weeds, does not affect mature monocotyledonous plants. It is used to prepare weed-free lawns by gardeners.

Gibberellins promotes bolting (internode elongation just prior to flowering) in beet, cabbages and many plants with rosette habit.

155. Answer: B

Sol:

Jim Corbett National Park was established in 1936, and it was named Hailey National Park after its founder Sir Malcolm Hailey. In 1956, in honour of Jim Corbett, who took the initiative for wildlife preservation in India, the Indian Government renamed it as Corbett National Park.

156. Answer: D

Sol:

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157. Answer: D

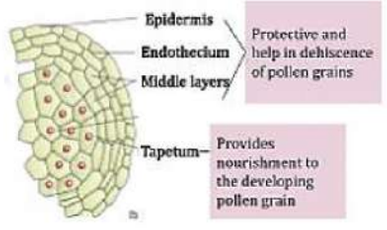
Sol:

(b), (c) and (d) only

158. Answer: B

Sol:

Microsporangia are sac-like structures present in angiosperm anthers. **epidermis, endothecium, middle layers, and tapetum.**



159. Answer: B

Sol:

Protein synthesis

160. Answer: B

Sol:

Statement I and II is correct, Explanation: DNA finger printing is highly reliable method of identification of individual involved in crimes. DNA a fingerprinting is a sure method in solving paternity and maternity disputes.DNA fingerprinting cannot be used to cure HIV infection.

161. Answer: B

Sol:

Only Statement I is correct

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162. Answer: A

Sol:

Hibiscus and papaver are the plants that contain multicarpellary and syncarpous gynoecium. Michelia are the plants that contain multicarpellary and apocarpous. Hibiscus and papaver are the plants that contain multicarpellary and syncarpous gynoecium. Michelia are the plants that contain multicarpellary and apocarpous.

163. Answer: B

Sol:

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164. Answer: B

Sol:

Ascaris, the common round worm and Wuchereria, the filarial worm, are some of the helminths which are known to be pathogenic to man. Ascaris, an intestinal parasite causes ascariasis. A healthy person acquires this infection through contaminated water, vegetables, fruits, etc.

Entamoeba histolytica is a protozoan parasite in the large intestine of human which causes amoebiasis (amoebic dysentery). Drinking water and food contaminated by the faecal matter are the main source of infection.

165. Answer: D

Sol:

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166. Answer: A

Sol:

Ovule is an integumented megasporangium found in spermatophytes which develops into seed after fertilization. An angiospermic ovule is typically an ovoid and whitish structure. It occurs inside ovary where it is attached to a parenchymatous cushion called placenta either singly or in a cluster. The ovule is stalked. The stalk is called funiculus or funicle. The point of attachment of the body of the ovule with the funiculus is known as hilum.

167. Answer: B

Sol:

For making of polypeptide chain of 20 amino acids required 21 codons, 20 codons code for amino acids and 1 will be termination codon or stop codon. Hence in a polypeptide chain 20 amino acid are present. 21 codons are present on mRNA which form this polypeptide chain.

168. Answer: D

Sol:

Innate immunity is non-specific type of defence, that is present at the time of birth. It consist of four types of barriers. These are —

Physical barriers : Skin on our body is the main barrier which prevents entry of the micro-organisms. Mucus coating of the epithelium lining the respiratory, gastrointestinal and urogenital tracts also help in trapping microbes entering our body.

Cellular barriers : Certain types of leukocytes (WBC) of our body like polymorpho-nuclear leukocytes (PMNL-neutrophils) and monocytes and natural killer (type of lymphocytes) in the blood as well as macrophages in tissues can phagocytose and destroy microbes.

Physiological barriers : Acid in the stomach, saliva in the mouth, tears from eyes– all prevent microbial growth.

Cytokine barriers : Virus-infected cells secrete proteins called interferons which protect non-infected cells from further viral infection.

169. Answer: B

Sol:

Centrosome is an organelle usually containing **two cylindrical structures** called **centrioles.**

Both the centrioles in a centrosome **lie perpendicular to each other** in which each has an **organisation like the cartwheel**.

The **centrioles form the basal body** of **cilia or flagella**, and **spindle fibres** that give rise to **spindle apparatus** during cell division in animal cells.

170. Answer: B

Sol:

Transcription is the process where an RNA molecule is synthesized from a DNA template. It involves the copying of a specific segment of DNA into RNA, which will later be used for protein synthesis during translation.

171. Answer: C

Sol:

- **(A) Biopsy – Histopathological studies for malignancy:**
  A biopsy involves taking a sample of tissue for microscopic examination to detect the presence of cancer cells. This is a correct match.
- **(B) Bone marrow test – To detect leukemia:**
  Bone marrow tests can help diagnose leukemia by examining the marrow for abnormal cells. This is also a correct match.
- **(C) MRI – Uses strong electric field and ionising radiations:**
  MRI (Magnetic Resonance Imaging) does **not** use ionizing radiation. It uses strong magnetic fields and radio waves to create images of organs and tissues. This makes the statement a mismatch.
- **(D) Computed tomography – Uses X-rays to generate 3-D image of organs:**
  A CT scan (or CAT scan) uses X-rays to generate detailed 3D images of internal structures, which is a correct match.

Thus, the mismatch is **(C)**, as MRI uses magnetic fields, not ionizing radiation.

172. Answer: A

Sol:

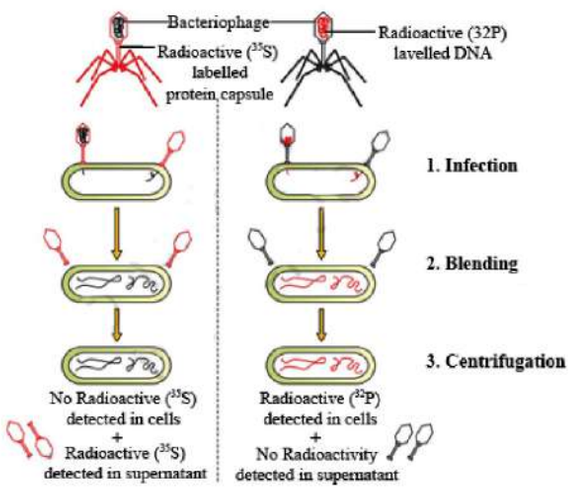
Mitosis	Meiosis
1) It occurs in somatic cells.	1) It occurs in germ cells.
2) Nucleus divides only once.	2) Nucleus divides twice.
3) Two daughter cells are formed.	3) Four daughter cells are formed.
4) Daughter cells are diploid.	4) Daughter cells are haploid.

173. Answer: A

Sol:

Hershey–Chase experiments (Bacterial transformation) were a series of experiments conducted in 1952 by Alfred Hershey and Martha Chase that helped to confirm that DNA is genetic material. In their experiments, Hershey and Chase showed that when bacteriophages (T2), which are composed of DNA and protein (DNA of a virus is labelled with ^{32}P and the protein of the virus is labelled with ^{35}S), infect bacteria, their DNA enters the host bacterial cell (labelled with ^{32}P), but most of their protein does not. Hershey and Chase and subsequent discoveries all served to prove that DNA is the hereditary material

Hershey and Chase experiment



174. Answer: A

Sol:

The first restriction nuclease characterized was isolated from Haemophilus influenzae bacteria. The enzyme (HindII) cuts at a particular site within a specific sequence of six base pairs as follows. (Where nucleotides are shown in parenthesis, the enzyme recognizes either one of the two bases shown.)

175. Answer: C

Sol:

In oocytes of some vertebrates, diplotene can last for months or years.

So Diplotene is the longest stage in prophase-1.

Thus right answer is C.

176. Answer: B

Sol:

After completion of the biosynthetic stage, the product has to be subjected through a series of processes before it is ready for marketing as a finished product. The processes include separation and purification, which are collectively referred to as downstream processing.

177. Answer: D

Sol:

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Mitosis is a type of cell division that plays a crucial role in:

(a) Growth: Mitosis allows multicellular organisms to grow by increasing the number of cells.

(b) Healing and regeneration: Mitosis helps in repairing damaged tissues and regenerating lost or damaged cells.

(c) Repair: Mitosis replaces dead or damaged cells, maintaining tissue integrity

(d) Maintenance of cell size: By producing new cells, mitosis helps maintain the size and function of tissues and organs.

178. Answer: D

Sol:

Mutated gene does not appear on a photographic film as the probe has no complimentarity with it.

179. Answer: A

Sol:

During G1 phase the cell is metabolically active and continuously grows but does not replicate its DNA.

S or synthesis phase marks the period during which DNA synthesis or replication takes place. during the S phase, DNA replication begins in the nucleus, and the centriole duplicates in the cytoplasm.

During the G2 phase, proteins are synthesised in preparation for mitosis while cell growth continues.

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180. Answer: A

Sol:

Vectors, microinjection, gene gun (biolistic) are all techniques that are helpful in inserting a foreign DNA into the host cell.

Retroviruses are disarmed and they are used for delivering desirable genes into the animal cells.

PBR322 is an artificial plasmid, generally used in *E.coli* as cloning vector.

Plasmid - They are defined as a small circular, self-replicating ,and double stranded DNA molecule present in the bacterial cell, in addition to bacterial chromosome/extra chromosomal material known as nucleoid.