

Course : NEET-UG (Pre-Medical)

Full Syllabus : Class-11th

Name of the Candidate (in Capitals) : _____

Form Number : in figures _____
: in words _____

Centre of Examination (in Capitals) : _____

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

Important Instructions :

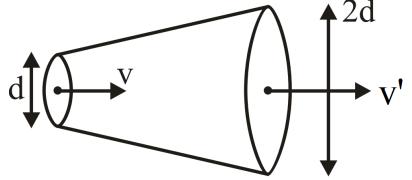
1. The Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars on ORIGINAL Copy carefully with **blue/black** ball point pen only.
2. The test is of **3 hours 20 minutes** duration and the Test Booklet contains **200** multiple-choice questions (four options with a single correct answer) from **Physics, Chemistry and Biology (Botany and Zoology)**. **50** questions in each subject are divided into **two Sections (A and B)** as per details given below :
 - (a) **Section A** shall consist of **35 (Thirty-five)** Questions in each subject (Question Nos - 1 to 35, 51 to 85, 101 to 135 and 151 to 185). All questions are compulsory.
 - (b) **Section B** shall consist of **15 (Fifteen)** questions in each subject (Question Nos - 36 to 50, 86 to 100, 136 to 150 and 186 to 200). In Section B, a candidate needs to **attempt any 10 (Ten)** questions out of **15 (Fifteen)** in each subject.

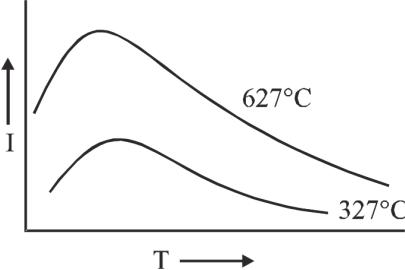
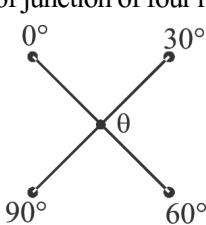
Candidates are advised to read all 15 questions in each subject of Section B before they start attempting the question paper. In the event of a candidate attempting more than ten questions, the first ten questions answered by the candidate shall be evaluated.

- 3. Each question carries **4** marks. For each correct response, the candidate will get **4** marks. For each incorrect response, **one mark** will be deducted from the total scores. **The maximum marks are 720**.
- 4. Use **Blue/Black Ball Point Pen only** for writing particulars on this page/marking responses on Answer Sheet.
- 5. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
- 6. On completion of the test, the candidate **must hand over the Answer Sheet (ORIGINAL and OFFICE Copy) to the Invigilator** before leaving the Room/Hall. The candidates are allowed to take away this Test Booklet with them.
- 7. 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 Form No. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
- 8. Use of white fluid for correction is **NOT** permissible on the Answer Sheet.
- 9. Each candidate must show on-demand his/her Allen ID Card to the Invigilator.
- 10. No candidate, without special permission of the Invigilator, would leave his/her seat.
- 11. The candidates should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and sign (with time) the Attendance Sheet **twice**. **Cases, where a candidate has not signed the Attendance Sheet second time, will be deemed not to have handed over the Answer Sheet and dealt with as an Unfair Means case.**
- 12. Use of Electronic/Manual Calculator is prohibited.
- 13. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Room/Hall. All cases of unfair means will be dealt with as per the Rules and Regulations of this examination.
- 14. **No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.**
- 15. The candidates will write the Correct Test Booklet Code as given in the Test Booklet/Answer Sheet in the Attendance Sheet.
- 16. Compensatory time of one hour five minutes will be provided for the examination of three hours and 20 minutes duration, whether such candidate (having a physical limitation to write) uses the facility of scribe or not.

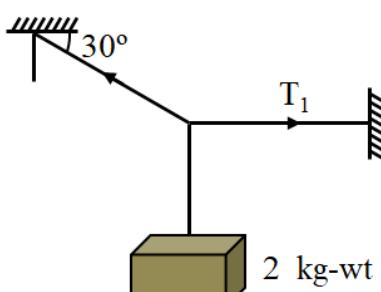
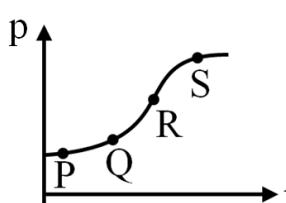
SECTION - A (PHYSICS)

1. The sum of the numbers 436.32, 227.2 and 0.301 in appropriate significant figures is-
- (1) 663.821 (2) 664
 (3) 663.8 (4) 663.82
2. If relation between position x of any particle & time t is given as $x = at^2 - bt^3$; at what time acceleration becomes zero?
- (1) $\frac{a}{b}$ (2) $\frac{2a}{3b}$ (3) $\frac{a}{3b}$ (4) Zero
3. A body starting falling freely under gravity. Then ratio of distance covered in first, second and third second is-
- (1) 1 : 3 : 5 (2) 1 : 2 : 3
 (3) 1 : 4 : 9 (4) 1 : 5 : 9
4. Two balls are released from height h & $2h$. Then ratio of time taken by them in reaching ground.
- (1) $1 : \sqrt{2}$ (2) $\sqrt{2} : 1$ (3) $2 : 1$ (4) $1 : 4$
5. When a bus takes sharp turn, passengers experienced outward thrust. Reason for this is :
- (1) Inertia of direction
 (2) Acceleration of motion
 (3) Speed of motion
 (4) Both (1) & (3)
6. A rocket is moving with 300 m/s. A force of 200 N is acting on it, then rate of burning of fuel is-
- (1) 0.7 kg/s (2) 1.4 kg/s
 (3) 0.07 kg/s (4) 10.7 kg/s
7. The angular speed of a motor wheel is increased from 1200 rpm to 3120 rpm in 16 seconds, then what is the angular acceleration of this wheel assuming it as constant ?
- (1) 2 rad/s^2 (2) 120 rad/s^2
 (3) $4\pi \text{ rad/s}^2$ (4) $240\pi \text{ rad/s}^2$

8. A body weights 63 N on the surface of earth. What is the gravitational force on it due to the earth at a height equal to half the radius of earth?
- (1) 28 N (2) 35 N
 (3) 42 N (4) 31.5 N
9. A 5 metre long wire is fixed to the ceiling. A weight of 10 kg is hung at the lower end. The wire is elongated by 1 mm, then the energy stored in the wire due to stretching is :
- (1) Zero (2) 0.05 Joule
 (3) 100 Joule (4) 500 Joule
10. Find v' for steady flow and incompressible liquid :-
- 
- (1) $4v$ (2) $2v$
 (3) $v/2$ (4) $v/4$
11. A wire of mass 1 gm is kept horizontally on the surface of water. The minimum length of the wire that does not break the surface film is (surface tension of water is 70 dyne cm^{-1})
- (1) 7 cm (2) 4 cm
 (3) 3 cm (4) 14 cm
12. A submarine is designed to withstand what pressure approximately, if it works at depth of 1 km from surface of sea water ?
- (1) 10 atm (2) 100 atm
 (3) 1000 atm (4) 10000 atm
13. Find out amount of heat required to convert 2 gm ice at -10°C into water at 60°C .
- (1) 130 cal (2) 290 cal
 (3) 300 cal (4) 400 cal

14. The co-efficient of linear expansion of crystal in one direction is α_1 and in other two directions is α_2 then co-efficient of volume expansion will be :-
- (1) $2\alpha_1 + \alpha_2$ (2) $3\alpha_1$
 (3) $\alpha_1 + 2\alpha_2$ (4) $3\left(\frac{\alpha_1 + \alpha_2}{2}\right)$
15. The spectra of a black body at temperatures 327°C and 627°C are shown in the fig. If A_1 and A_2 be the areas under the two curves respectively, the value of A_2/A_1 is :
- 
- (1) $\frac{81}{16}$ (2) $\frac{9}{4}$
 (3) $\frac{27}{8}$ (4) $\frac{16}{81}$
16. During an isothermal expansion, a confined ideal gas does $+250\text{ J}$ of work against its surroundings. This implies that :-
- (1) 250 J of heat has been removed from the gas
 (2) 300 J of heat has been added to the gas
 (3) No heat is transferred because the process is isothermal
 (4) 250 J of heat has been added to the gas
17. Four rods of same material and having the same cross section area and length have been joined, as shown. The temperature of junction of four rods will be-
- 
- (1) 20°C (2) 30°C
 (3) 45°C (4) 60°C
18. The equation of SHM is given as :
 $x = 3 \sin 20\pi t + 4 \cos 20\pi t$
 where x is in cm and t is in seconds. The amplitude is :
 (1) 7 cm (2) 4 cm (3) 5 cm (4) 3 cm
19. The screw gauge has least count of 0.005 mm and its circular scale is divided into 100 equal divisions. What is the distance between two consecutive threads of its screw ?
- (1) 0.5 mm (2) 0.05 mm
 (3) 0.01 mm (4) 0.1 mm
20. Viscosity of liquids :-
- (1) Increases with increase in temperature
 (2) Is independent of temperature
 (3) Decreases with decrease in temperature
 (4) Decreases with increase in temperature
21. A block of mass 2.4 kg is heated to temperature of 500°C and placed on a large ice block. What is the maximum amount of ice that can melt (approx.)? Specific heat for the block = $0.1\text{ Cal/gm}^\circ\text{C}$.
- (1) 1 kg (2) 1.5 kg (3) 2 kg (4) 2.5 kg
22. A force $(4\hat{i} + \hat{j} - 2\hat{k})\text{ N}$ acting on a body maintains its velocity at $(2\hat{i} + 2\hat{j} + 3\hat{k})\text{ m/s}$. The power exerted by the force is :
- (1) 4W (2) 5W (3) 2W (4) 8W
23. **Statement-I** : A body moving with higher speed has more kinetic energy.
Statement-II : Kinetic energy of a body is directly proportional to its speed.
- (1) Both statement-I and statement-II are true and statement-II is the correct explanation of statement-I
 (2) Both statement-I and statement-II are true and statement-II is not the correct explanation of statement-I
 (3) Statement-I is true but statement-II is not true
 (4) Statement-I is not true but statement-II is true

24. A body of mass m thrown vertically upward attains a maximum height ' h '. At what height will its kinetic energy be 75% of its initial value ?
- (1) $\frac{h}{6}$ (2) $\frac{h}{5}$
 (3) $\frac{h}{4}$ (4) $\frac{h}{3}$
25. A 0.2 kg ball moves in a circle of radius 0.1 m at a speed 2 m/s. The centripetal force on the ball is:
- (1) 20 N (2) 40 N (3) 60 N (4) 8 N
26. During inelastic collision between two bodies, which of the following quantity always remains conserved ?
- (1) Total kinetic energy
 (2) Total mechanical energy
 (3) Total linear momentum
 (4) Speed of each body
27. The centre of mass of a solid cone along the line from the centre of the base to the vertex is at :
- (1) One-fourth of the height
 (2) One-third of the height
 (3) One-fifth of the height
 (4) None of these
28. The position of the particle moving along Y-axis is given as $y = At^2 - Bt^3$, where y is measured in metre and t in second. Then, the dimensions of B are-
- (1) $[LT^{-2}]$ (2) $[LT^{-1}]$
 (3) $[LT^{-3}]$ (4) $[MLT^{-2}]$
29. A particle is moving with constant acceleration starting from rest for 20 sec. If S_1 & S_2 is the distance travelled in first 10 sec & next 10 sec respectively, then
- (1) $S_1 = S_2$ (2) $S_1 = S_2 / 3$
 (3) $S_1 = S_2 / 2$ (4) $S_1 = S_2 / 4$

30. **Assertion :** Position time graph for a body at rest is a straight line parallel to time axis.
Reason : Position of stationary body does not change with time.
- (1) Assertion & Reason both are correct and Reason is correct explanation.
 (2) Assertion & Reason, both are correct but reason is not correct explanation.
 (3) Assertion is correct but Reason is wrong.
 (4) Both assertion & Reason are incorrect.
31. A body of 2 kg-wt is hanged as shown. Then tension in horizontal string (in kg-wt) is-
- 
- (1) $2/\sqrt{3}$ (2) $\sqrt{3}/2$
 (3) $2\sqrt{3}$ (4) 2
32. After collision of two bodies, a graph is plotted between time & change in momentum of one body. Then instantaneous of force is maximum at which point ?
- 
- (1) P (2) Q
 (3) R (4) S
33. In a gaseous medium on increasing temperature by 800 K, speed of sound becomes $\sqrt{5}$ times of initial, then initial temperature of medium in $^{\circ}\text{C}$ is :-
- (1) 27°C (2) 300°C
 (3) -73°C (4) 73°C

- 34.** The first two resonance lengths in a resonance tube formed are 16.5 cm and 51 cm. The end correction for the tube is :-

 - 0.25 cm
 - 0.50 cm
 - 0.75 cm
 - 1.00 cm

35. A body is allowed to fall freely under gravity from a height of 10 m. If it losses 25% of its energy on the impact with the ground, to what height will it rise after the impact ?

 - 7.5 m
 - 5 m
 - 2.5 m
 - 1 m

SECTION - B (PHYSICS)

36. If vectors \vec{A} and \vec{B} have an angle θ between them, then value of $|\hat{A} - \hat{B}|$ will be-

 - $2 \cos \frac{\theta}{2}$
 - $2 \tan \frac{\theta}{2}$
 - $2 \sin \frac{\theta}{2}$
 - None of these

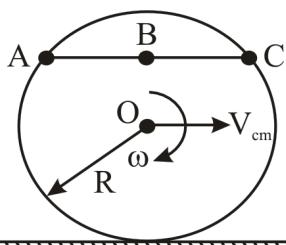
37. **Assertion :** When lift moves with constant speed, person inside it feels weightlessness.
Reason : Apparent weight of body in a downward accelerated lift decreases.

 - Both assertion & Reason are correct and reason is correct explanation of assertion.
 - Both assertion & Reason are correct, but reason is not a correct explanation of assertion.
 - Assertion is correct but Reason is incorrect.
 - Assertion is incorrect but reason is correct.

38. Two particles, each of mass m and speed v , travel in opposite direction along parallel lines separated by a distance d . Then, angular momentum of this system about any point in the plane of particles is-

 - $2mvd$
 - mvd
 - $3mvd$
 - zero

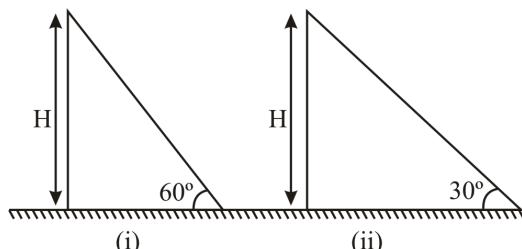
44.



A disc is rolling without slipping on a level surface, such that velocity of its centre of mass is V_{cm} and angular velocity of disc about its axis which passes through centre O is ω ; then correct order of velocities of point A, B and C on the disc is-

- (1) $V_A = V_B = V_C$ (2) $V_A > V_B > V_C$
 (3) $V_A = V_C > V_B$ (4) $V_A = V_C < V_B$

45.



A solid sphere rolls down two different inclined planes of the same heights but different angles of inclination.

The speeds of sphere at bottom, in both cases are v_1 and v_2 respectively.

The time taken by sphere to reach ground along both inclined planes are t_1 and t_2 respectively.

Then, which of the following relations is correct?

- (1) $v_1 = v_2$ and $t_1 < t_2$ (2) $v_1 < v_2$ and $t_1 < t_2$
 (3) $v_1 > v_2$ and $t_1 > t_2$ (4) $v_1 = v_2$ and $t_1 = t_2$

46.

In elliptical orbit of a planet, as the planet moves from apogee position to perigee position :-

List - I		List - II	
(P)	Speed of planet	(1)	Remains same
(Q)	Distance of planet from centre of Sun	(2)	Decreases
(R)	Potential energy	(3)	Increases
(S)	Angular momentum about centre of Sun	(4)	Can not say

- (1) P-3; Q-2; R-2; S-1 (2) P-1; Q-2; R-2; S-3
 (3) P-3; Q-1; R-2; S-2 (4) P-3; Q-2; R-1; S-2

47. The sap in trees, which consists mainly of water in summer, rises in a system of capillaries of radius 20 micron. The surface tension of sap is 70 dyne/cm and the angle of contact is 0° . If surface tension alone account for the supply of water to the top of the tree then what should be the height of tree ? ($g = 1000 \text{ cm/s}^2$)

- (1) 0.7 m (2) 70 m
 (3) 1.4 m (4) 140 m

48. A pendulum clock is 5 sec fast at temperature of 15°C and 10 seconds slow at a temperature of 30°C . At what temperature does it give the correct time ?

- (1) 18°C
 (2) 20°C
 (3) 22°C
 (4) 25°C

49. The motion of a particle varies with time according to the relation :-

$$y = a(\sin \omega t + \cos \omega t), \text{ then :}$$

- (1) the motion is oscillatory but not SHM
 (2) the motion is SHM with amplitude a
 (3) the motion is SHM with amplitude $a\sqrt{2}$
 (4) the motion is SHM with amplitude $2a$

50. A ball of mass 'm' moving with a speed $2v_0$ collides head on with an identical ball at rest. If 'e' is the coefficient of restitution, then what will be the ratio of velocity of two balls after collisions ?

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

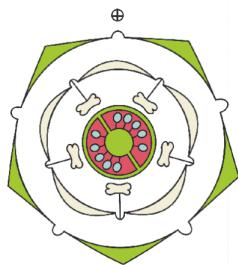
SECTION - A (BOTANY)

- 51.** The number of species that are known, ranges between :-
 (1) 7.8 million
 (2) 1.7 - 1.8 million
 (3) 1.7-1.8 billion
 (4) 30 million
- 52.** Binomial nomenclature system was given by -
 (1) Aristotle
 (2) Carolus Linnaeus
 (3) Ernst Mayr
 (4) Bentham and Hooker
- 53.** One longitudinal and one transverse flagella in a furrow between the cell wall plates is speciality of :-
 (1) Chrysophytes (2) Euglenoides
 (3) Dinoflagellates (4) Eubacteria
- 54.** Which of the following fungi is example of basidiomycetes ?
 (1) Mushroom (2) Bracket fungi
 (3) Puffballs (4) All
- 55.** Consider the following statements. Which of the following statements are related to universal rules of nomenclature ?
 (a) Scientific names are generally in latin.
 (b) The first word in a scientific name represents the generic name while the second component denotes the specific epithet.
 (c) Both the words in a scientific name, when handwritten, are separately underlined.
 (d) Generic name starts with a capital letter while the specific epithet starts with a small letter.
 (1) Only b, c & d (2) Only c & d
 (3) Only a, c & d (4) All a, b, c & d

- 56.** Which plant is used as packing material for sending seedling, flowers and living plants ?
 (1) *Sphagnum* (2) *Selaginella*
 (3) *Cycas* (4) *Funaria*
- 57.** Which event is a precursor to the seed habit considered as an important step in evolution ?
 (1) Embryo formation
 (2) Endosperm formation
 (3) Heterosporous habit
 (4) Vascular tissue development
- 58.** Which of the following statement is correct ?
 (1) In ferns asexual reproduction takes place by green, multicellular buds called gemmae.
 (2) The sporophyte in bryophytes is differentiated into foot, seta and capsule and it is a free living generation
 (3) Protonema is a green, creeping, branched and filamentous stage in mosses, which develops directly from a spore.
 (4) The liverworts have peristomial teeth for spore dispersal.
- 59.** Match the following columns
- | | Column-I | | Column-II |
|-----|-------------------------|-------|------------------|
| (a) | Underground stem | (i) | <i>Euphorbia</i> |
| (b) | Stem tendril | (ii) | <i>Cucumber</i> |
| (c) | Stem thorns | (iii) | <i>Opuntia</i> |
| (d) | Flattened stem | (iv) | <i>Citrus</i> |
| (e) | Fleshy cylindrical stem | (v) | <i>Zamikand</i> |
-
- | Options | a | b | c | d | e |
|----------------|----------|----------|----------|----------|----------|
| (1) | v | iv | ii | iii | i |
| (2) | v | ii | iii | iv | i |
| (3) | v | ii | iv | i | iii |
| (4) | v | ii | iv | iii | i |

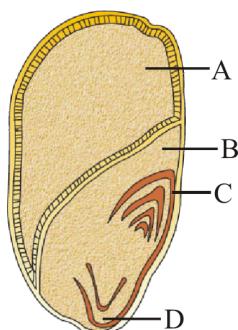
60. In cymose type of inflorescence :-
 (A) Main axis terminate into flower
 (B) Flower born in basipetal order
 (C) Main axis do not terminate into flower
 (D) Flower born in acropetal order
 (1) A and B only (2) C and D only
 (3) A and C only (4) B and C only

61. Study carefully the given floral diagram and select the option which correctly represent the floral formula related to this family :-



- (1) $\% \text{♀} \text{♂} K_{(5)} C_{(5+2+2)} A_5 \overline{G}_{(2)}$
 (2) $\oplus \text{♀} \text{♂} K_{(5)} C_{(5)} \overbrace{A_{(5)}} G_{(2)}$
 (3) $\oplus \text{♀} \text{♂} P_{5+5} A_{(5)} \underline{G}_{(2)}$
 (4) $\oplus \text{♀} \text{♂} K_{(5)} C_{(5)} \overbrace{A_5} \underline{G}_{(2)}$

62. Given below is the diagram of monocotyledons seed and identify the parts labelled A, B, C, D.



	Part A	Part B	Part C	Part D
(1)	Endosperm	Scutellum	Coleoptile	Coleorrhiza
(2)	Scutellum	Endosperm	Coleorrhiza	Coleoptile
(3)	Scutellum	Coleorrhiza	Coleoptile	Endosperm
(4)	Coleorrhiza	Coleoptile	Scutellum	Endosperm

63. Which of the following tissue system consist of all three kind of simple tissues ?

- (1) Epidermal tissue system
 (2) Ground tissue system
 (3) Vascular tissue system
 (4) Epidermal and vascular tissue system

64. Trichomes are usually _____ & help in _____

- (1) Unicellular, reduction of water loss
 (2) Multicellular, reduction of water loss
 (3) Multicellular, absorbing water from soil
 (4) Unicellular, absorbing water from soil

65. **Statement-I** : In dicot root, the vascular cambium is completely secondary in origin.

Statement-II : In monocot root, the vascular cambium is partially primary and partially secondary in origin.

- (1) Statement I and II both are correct
 (2) Statement I and II both are incorrect
 (3) Only Statement I is correct
 (4) Only Statement II is correct

66. The 'A' arrangement of vascular bundle is a characteristic of 'B'. :-

- (1) A - Ring B - Dicot stem
 (2) A - Scattered B - Dicot root
 (3) A - Ring B - Monocot stem
 (4) A - Scattered B - Monocot root

67. The cell wall and middle lamella may be transversed by "A"..... which connect the "B" ... of neighbouring cells.

Choose the correct option for "A" and "B".

- (1) A → Endoplasmic reticulum, B → DNA
 (2) A → Golgi apparatus, B → Cytoplasm
 (3) A → Plasmodesma, B → Cytoplasm
 (4) A → Plasmodesma, B → DNA

- 68.** Mitochondria perform all the following function except :-

 - ATP synthesis
 - Protein synthesis
 - Oxidation of food
 - Glycolipid formation

69. Match column-I with column-II and select the correct option from the codes given below:

	Column-I		Column-II
(A)	Axonemes	(i)	Centriole
(B)	9 + 0 microtubule arrangement	(ii)	Cytoskeleton
(C)	Mechanical support	(iii)	Flagellum
(D)	Svedberg's unit	(iv)	Ribosome

 - $A \rightarrow ii, B \rightarrow iii, C \rightarrow i, D \rightarrow iv$
 - $A \rightarrow i, B \rightarrow iii, C \rightarrow iv, D \rightarrow ii$
 - $A \rightarrow iii, B \rightarrow i, C \rightarrow ii, D \rightarrow iv$
 - $A \rightarrow iii, B \rightarrow ii, C \rightarrow i, D \rightarrow iv$

70. Controlling centre of cell is :-

 - Nucleus
 - Nucleolus
 - Mitochondria
 - Ribosome

71. If the initial amount of DNA in G_1 phase is denoted by $2C$ then the amount of DNA present in cell after S phase:

 - $2C$
 - $8C$
 - $1C$
 - $4C$

72. Which phase corresponds to the interval between the DNA replication and mitotic phase _____ ?

 - G_1
 - S
 - G_2
 - Interphase

73. The division of centromere occurs in :-

 - S-phase
 - Metaphse-I
 - Anaphase
 - Anaphase-I

- 74.** Match the columns :

	Column-I (Scientists)		Column-II (Discoveries)
(A)	Stephen Hales	(1)	Importance of light and chlorophyll
(B)	Ingenhousz	(2)	Action spectrum of photosynthesis
(C)	T.W. Engelmann	(3)	Product of photosynthesis is starch
(D)	Von Sachs	(4)	Discoverer of photosynthesis

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

75. Read the following statements-

 - A. The LHC are made up of hundreds of pigment molecules bound to proteins
 - B. The single chlorophyll a molecule forms the reaction centre.
 - (1) Only A is incorrect
 - (2) Only B is correct
 - (3) Both A and B are correct
 - (4) Both A and B are incorrect

76. PGA as the first CO_2 fixation was discovered in photosynthesis of :

 - (1) Bryophyte (2) Gymnosperm
 - (3) Angiosperm (4) Alga

77. Which of the following do not help in gases exchange in plants ?

 - (1) Lenticels
 - (2) Stomata
 - (3) Loose packing of parenchyma cells in leaf
 - (4) Hydathodes

78. The step in which $\text{NADH}+\text{H}^+$ is not produced is :-
- $\text{Succinyl-CoA} \rightarrow \text{Succinate}$
 - $\text{Pyruvate} \rightarrow \text{Acetyl-CoA}$
 - $\alpha\text{-ketoglutarate} \rightarrow \text{Succinyl-CoA}$
 - $\text{Malate} \rightarrow \text{OAA}$
79. (I) "Y" hormone induced flowering in mango and also promotes rapid internode/petiole elongation in deep water rice plants and hence helping leaves or upper part of shoot above water.
- (II) "X" hormone promotes root growth and root hair formation.
- (III) "Z" hormone inhibits the seed germination, increases the tolerance of plant to various stresses, play important role in seed development, maturation and dormancy.
- Identify the correct names of the hormones :-
- $\text{Y} = \text{ABA}; \text{X} = \text{Auxin}; \text{Z} = \text{GA}$
 - $\text{Z} = \text{GA}; \text{X} = \text{Auxin}; \text{Y} = \text{C}_2\text{H}_4$
 - $\text{Y} = \text{Auxin}; \text{X} = \text{C}_2\text{H}_4; \text{Z} = \text{GAA}$
 - $\text{Y} = \text{C}_2\text{H}_4; \text{X} = \text{C}_2\text{H}_4; \text{Z} = \text{ABA}$
80. If we plot the parameter of growth against time, we get a typical :
- Sigmoid curve
 - Parabolic curve
 - L shaped curve
 - Bell shaped curve
81. Which of the following statements are true for enzymes ?
- Each enzyme shows highest activity at optimum temperature.
 - Enzyme which catalyse hydrolysis called lyases.
 - Competitive inhibitors are used often in control of bacterial pathogens.
 - When the binding of the chemical shuts off enzyme activity it is called inhibition
- Select the correct answer.
- a, b, d
 - a, c, d
 - b, c, d
 - a, b, c, d
82. Which of the following is alkaloid ?
- Codeine
 - Monoterphenes
 - Abrin
 - Curcumin
83. Smallest water soluble polysaccharide which consist of fructose units is-
- Chitin
 - Inulin
 - Heparin
 - Cellulose
84. Given below is the structure of :-
- $$\text{CH}_3(\text{CH}_2)_{14}-\underset{\underset{\text{O}}{\parallel}}{\text{C}}-\text{OH}$$
- oleic acid
 - Galactose
 - Arachidonic acid
 - Palmitic acid
85. What is the R group in serine ?
- $-\text{CH}_3$
 - $-\text{H}$
 - $-\text{CH}_2-\text{OH}$
 - $-\text{CH}_2-\text{SH}$
- ### SECTION - B (BOTANY)
86. Select the correct statement with respect to living organisms :-
- Growth and cellular organisation are considered as defining properties of living organisms.
 - Reproduction can be an all-inclusive defining characteristic of living organisms.
 - Living organisms are self-replicating, self-regulating and evolving interacting systems.
 - Isolated metabolic reactions in vitro are living organisms.
87. Bacteria reproduce mainly by :
- Budding
 - Endospore
 - Fission
 - Sexual reproduction
88. Choose the wrong match -
- | | | |
|-----|-----------------------|----------------------|
| (1) | <i>Truffles</i> | Edible mushroom |
| (2) | <i>Agaricus</i> | Somatogamy |
| (3) | <i>Sac fungi</i> | Coprophilous |
| (4) | <i>Colletotrichum</i> | Red rot of sugarcane |

89. Match the column-I with column-II and select the correct option from options given below :

Column-I		Column-II	
(A)	Lichen	(P)	Algae and fungi symbiosis
(B)	Mycorrhiza	(Q)	Fungi and higher plant root symbiosis
(C)	Prions	(R)	Infectious protein molecules
(D)	Viroids	(S)	Infectious RNA

- (1) A-P, B-Q, C-R, D-S
- (2) A-Q, B-P, C-R, D-S
- (3) A-P, B-Q, C-S, D-R
- (4) A-Q, B-P, C-S, D-R

90. Given below are two statements : One is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

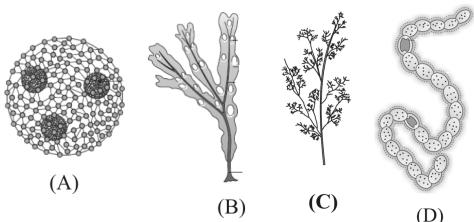
Assertion (A) : In gymnosperms the pollen grains are released from the microsporangium and carried by air currents.

Reason (R) : Air currents carry the pollen grains to the mouth of the archegonia where the male gametes are discharged and pollen tube is not formed.

In the light of the above statements, choose the **correct** answer from the options given below:

- (1) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.
- (2) **A** is true but **R** is false.
- (3) **A** is false but **R** is true
- (4) Both **A** and **R** are true and **R** is the correct explanation of **A**.

91. The four sketch (A,B, C and D) given below represent four different types of organism. Which one of these is correctly identified in the options given, along with its correct stored food and class



		Name of Organism	Stored Food	Class
(1)	(D)	<i>Nostoc</i>	Glycogen	Chlorophyceae
(2)	(A)	<i>Volvox</i>	Floridean starch	Chlorophyceae
(3)	(B)	<i>Laminaria</i>	starch	Phaeophyceae
(4)	(C)	<i>Polysiphonia</i>	Floridean starch	Rhodophyceae

92. The primary root is short lived and is replaced by a large number of roots. These roots originate from the base of the stem and found in :-

- (1) Mustard
- (2) *Pinus*
- (3) Wheat
- (4) *Mirabilis*

93. Match the two columns and give the correct answers :-

Column-I		Column-II	
	Plants		Uses
(i)	<i>Atropa, Aloe, Ashwagandha</i>	(a)	Ornamental uses
(ii)	Ground nut, Soyabean, Mustard	(b)	Food sources
(iii)	Gram, <i>Asparagus</i> , Potato	(c)	Edible oil
(iv)	Lupin, Sweet Pea, Tulip	(d)	Medicinal source

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

94. **Statement-I** : In radial vascular bundles xylem and phloem are arranged in an alternate manner along the different radii.

Statement-II : In conjoint vascular bundles, the xylem and phloem are jointly situated along the same radius.

- (1) Statement I and II both are correct
- (2) Statement I and II both are incorrect
- (3) Only Statement I is correct
- (4) Only Statement II is correct

95. Read the different components from (a) to (d) in the list given below and find the correct order of the components with reference to their arrangement from outer side to inner side in a woody dicot stem:

- (a) Secondary cortex (b) Wood
(c) Secondary phloem (d) Phellem

The correct order is :

- (1) (d), (c), (a), (b)
- (2) (c), (d), (b), (a)
- (3) (a), (b), (d), (c)
- (4) (d), (a), (c), (b)

96. (A) Unicellular organisms are capable of independent existence

- (B) Cell is the fundamental structural and functional unit of all organisms
(C) All cells arise from pre-existing cells
(D) The cytoplasm is the main arena of cellular activities only in animal cells.

Option :

- (1) Statement A, C and D are wrong
- (2) Statement A, B and D are wrong
- (3) Statement A, B and C are not wrong
- (4) Statement B, C and D are wrong

97. Match the following :-

Column-I		Column-II	
(a)	Cristae	(i)	Chromatin
(b)	Glycosylation	(ii)	Mitochondria
(c)	Rubisco	(iii)	Chloroplast
(d)	Histones	(iv)	Golgi complex

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

98. At which stage of meiosis, do these events occur ?

	Bivalents more clearly visible	Formation of synaptonemal complex	Terminalisation of chiasmata
(1)	Leptotene	Zygotene	Pachytene
(2)	Zygotene	Pachytene	Diakinesis
(3)	Pachytene	Zygotene	Diakinesis
(4)	Zygotene	Diplotene	Diakinesis

99. In Embden, Meyerhof and Parnas pathway respectively at how many steps ATP is synthesised, NAD⁺ is reduced and ATP is utilised ?

- (1) Two, One and Two
- (2) One, Two and One
- (3) Five, Two and Two
- (4) Three, One and Two

100. Match column-I with column-II and choose the correct option.

	Column-I		Column-II
(a)	Oxidoreductases	(i)	Catalyzes a transfer of a group (other than hydrogen) between a pair of substrate.
(b)	Transferases	(ii)	Catalyzes interconversion of optical, geometric or positional isomers.
(c)	Isomerases	(iii)	Catalyzes oxidoreduction between two substrates.

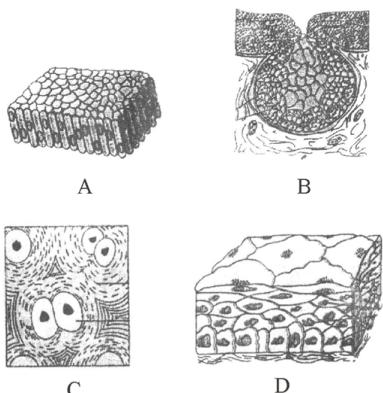
	(a)	(b)	(c)
(1)	(iii)	(i)	(ii)
(2)	(iii)	(ii)	(i)
(3)	(ii)	(i)	(iii)
(4)	(ii)	(iii)	(i)

SECTION - A (ZOOLOGY)

- 101.** First triploblastic animal phylum is ?
 (1) Coelenterata (2) Ctenophora
 (3) Annelida (4) Platyhelminthes
- 102.** Canal system of porifera is not related with :-
 (1) Food gathering
 (2) Locomotion
 (3) Respiratory gas exchange
 (4) Removal of waste
- 103.** Which of following phylum has tissue level organization ?
 (1) Porifera (2) Mollusca
 (3) Chordata (4) Cnidaria
- 104.** You are observing an animal closely and you find some characters such as :-
 * Endoskeleton made up of cartilage.
 * Mouth is located ventrally.
 * The skin is tough, containing placoid scales .
 * Notochord persist through out life.
 * Air bladder is absent.
 After observing the above features, in which group will you classify that animal ?
 (1) Chondrichthyes
 (2) Osteichthyes
 (3) Cyclostomata
 (4) Cephalochordata
- 105.** Choose the correct statement :
 (1) All mammals are viviparous
 (2) All cyclostomates do not possess jaw and paired fins
 (3) All reptiles have a three chambered heart
 (4) All fishes have gills covered by an operculum

- 106.** Read the following statements from A-D ?
 (A) Forelimb modified into wings.
 (B) Skin is dry without glands.
 (C) Digestive tract has additional chambers, the crop and gizzard.
 (D) They are warm blooded.
 These statements are correct for which animal ?
 (1) *Vipera* (2) *Columba*
 (3) *Labeo* (4) *Pteropus*
- 107.** Cells of which tissue are packed compactly with little intercellular matrix ?
 (1) Dense connective tissue
 (2) Muscle
 (3) Epithelium
 (4) Bone
- 108.** Which of the following type of cell junction allows rapid transfer of ions, small molecules and some times big molecules-
 (1) Interdigititation (2) Desmosomes
 (3) Tight junction (4) Gap junction
- 109.** Epithelial tissue is not related with following characteristic :-
 (1) Little intercellular space
 (2) No free surface
 (3) Rapid mitotic divisions are found
 (4) Some cubical or columnar cells are part of glandular epithelium
- 110.** Which of the following is mismatched?
- | | | | |
|-----|-------------------------------|---|-------------------------------------|
| (1) | Squamous epithelium | : | Walls of blood vessels and air sacs |
| (2) | Elastic cartilage | : | Tip of nose and ear pinna |
| (3) | Ciliated epithelium | : | Bronchioles and fallopian tubes |
| (4) | Specialised connective tissue | : | Tendon |

111. The four sketches (A, B, C and D) given below represent four different types of animal tissue. Which one of these is correctly identified in the options given along with its correct location and function?



	Tissue	Location	Function
(1)	A	Simple columnar epithelium	Air sacs of lungs Diffusion Boundary
(2)	B	Unicellular gland	Alimentary canal Secretion
(3)	C	Cartilage	Trachea Support
(4)	D	Compound epithelium	endothelium of blood vessels Protection

112. Malpighian tubules remove excretory products from
- Haemolymph
 - Alimentary canal
 - Both (1) and (2)
 - None of these

113. Common Indian bull frog is :-

- Rana tigrina
- Rana esculenta
- Rana sylvatica
- Rana goliath

114. Match the column (A) with Column (B)

	(A)		(B)
i	Heart	a	Cutaneous respiration
ii	Nephron	b	4 – Chambered
iii	Lungs	c	Thorax region
iv	Skin	d	Ultra filtration

Choose correct match from given below?

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

115. A sigmoid curve is obtained when percentage saturation of hemoglobin with O₂ is plotted against the PO₂. This curve is called ?

- CO₂ dissociation curve
- CO₂ association curve
- O₂ dissociation curve
- O₂ association curve

116. Every 500 ml of oxygenated blood can deliver around _____ ml of O₂ to the tissues under normal conditions

- 5
- 50
- 25
- 100

117. Match the column-I & Column-II correctly :-

Column-I		Column-II	
(i)	Conducting part	(a)	External nostrils → terminal bronchioles
(ii)	Exchange part	(b)	Alveolies and their ducts
(iii)	Air tight chamber	(c)	Thoracic cavity
(iv)	Vascular, thin walled bag	(d)	Alveoli

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

118. Which of the following nitrogenous substance is highly toxic ?

- Urea
- Uric acid
- Amino acid
- Ammonia

119. Other function performed by kidney apart from excretion is :-

- Osmoregulation
- Temperature regulation
- Hormonal regulation
- Regulation of immune system

- 120.** **Assertion :** The amount of the filtrate formed by the kidneys per minute is called GFR.
Reason : GFR in a healthy individual is approximately 125 ml/minute.

 - Both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
 - Both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
 - Assertion is True but the Reason is False.
 - Both Assertion & Reason are False.

121. **Assertion :-** The pause between the end of the second sound and the beginning of the first sound coincides with ventricular diastole.
Reason :- The second sound (dupp) is created by the closure of the semilunar valve.

 - Both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
 - Both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
 - Assertion is True but the Reason is False.
 - Both Assertion & Reason are False.

122. **Statement-I :** Fibrinogen is needed for clotting or coagulation of blood.
Statement-II : All factors for coagulation or clotting of blood are also present in the plasma in an active form.

 - Both Statement I and Statement II are correct
 - Statement I is correct and Statement II is incorrect.
 - Statement I is incorrect and Statement II is correct.
 - Both Statement I and Statement II are incorrect

123. Intercalated disc found in–

 - Smooth muscle (2) Voluntary muscle
 - Both (1) and (2) (4) Cardiac muscle

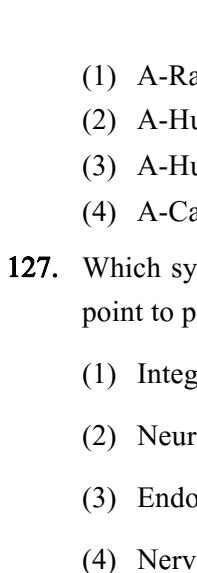
124. **Statement-I :** Red muscle contain plenty of mitochondria which can utilise the large amount of O₂ stored in them for ATP production.
Statement-II : Red muscles depend on anaerobic process for energy.

 - Statement-I are correct but Statement-II incorrect.
 - Statement-I are incorrect but Statement-II correct.
 - Both Statement are correct.
 - Both Statement are incorrect.

125. Which one of the following term is not used while describing human vertebra?

 - Thoracic (2) Lumbar
 - Coxal (4) Sacral

126. Identify the given below diagram and match correct option :-



(1) A-Radius, B-Ulna, C-Humerus, D-Carpals
(2) A-Humerus, B-Radius, C-Ulna, D-Carpals
(3) A-Humerus, B-Ulna, C-Radius, D-Carpals
(4) A-Carpals, B-Ulna, C-Radius, D-Humerus

127. Which system provides an organised network of point to point connection ?

 - Integrative system
 - Neuro-endocrine system
 - Endocrine system
 - Nervous system

128. When a nerve fibers is stimulated the inside of the membrane becomes :-

 - Either positive or negative
 - Negatively charged
 - Positively charged
 - Neutral

129. Ion responsible for excited stage is

 - K⁺ (2) Cl⁻ (3) Ca⁺² (4) Na⁺

130. Anti-inflammatory hormone is

 - Aldosterone (2) Cortisol
 - Adrenaline (4) DHEA

131. Which hormone is responsible for increase in calcium level in blood ?
 (1) Thyroxine (2) PTH
 (3) Calcitonin (4) Adrenaline

132. Which of the following hormone is secreted by pineal gland ?
 (1) Melanin (2) Melatonin
 (3) Melanocyte (4) MSH

133. The adrenal cortex secretes many hormones, commonly called as corticoids. All of the following functions are of corticoids except one –
 (1) Carbohydrate metabolism.
 (2) Regulate the balance of water and electrolytes
 (3) Development of secondary sex characters
 (4) Uterine contractions during parturition

134. Select the option with incorrect matching :

	A	B
(1)	Estrogen	Mammary gland development
(2)	Progesterone	Supports pregnancy
(3)	Cortisol	Stimulate Inflammatory reaction
(4)	Thyroxine	Regulation of BMR

135. Which of the following statements about hormone is/are correct ?
 (A) Hormone may be protein or steroids.
 (B) Hormones are non nutritive, non antigenic and non species specific.
 (C) Hormones are not stored without exception.
 (D) All hormone have same mechanism of binding for functioning.
 (1) A & C are correct and B & D are false
 (2) B & D are correct and A & C are false
 (3) A & B are correct and C & D are false
 (4) C & D are correct and A & B are false

SECTION - B (ZOOLOGY)

136. Polyps produce medusa by _____ and medusa forms polyps by _____.
 (1) Sexual reproduction, Asexual reproduction
 (2) Asexual reproduction, Sexual reproduction
 (3) Sexual reproduction, sexual reproduction
 (4) Asexual reproduction, Asexual reproduction
137. Which one of the following statement is totally wrong about the occurrence of notochord while the other three are correct ?
 (1) It is present throughout life in Amphioxus
 (2) It is present only in larval tail in Ascidians
 (3) It is replaced by a vertebral column in adult frog
 (4) It is absent throughout life in humans from the very beginning of embryological stage

138. Consider the following four statement (A to D). select the correct option stating which ones are true (T) and which ones are false (F)

A- corals have calcium carbonate as exoskeleton
 B- Some members of platyhelminthes show high regeneration capacity
 C- Cycloid scales are seen in cartilaginous fishes.

- D- mammary gland bearing animals have Pinna
- (1) A - T, B - T, C - F, D - T
 (2) A - F, B - T, C - F, D - T
 (3) A - F, B - F, C - T, D - T
 (4) A - F, B - F, C - T, D - F

139. Non-keratinised stratified epithelium occurs in
 (1) Vagina, cervix and buccal cavity
 (2) Vagina, cervix, buccal cavity and stomach
 (3) Vagina and nasopharynx
 (4) Buccal cavity and skin

140. Match the following column A and B

	(A)		(B)
i	RBC	a	Leucocytes
ii	WBC	b	Spinal cord
iii	Heart	c	Enucleated
iv	CNS	d	Muscular

Choose correct match from below :

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

141. Which of the following is an example of cutaneous respiration ?

- (1) Frog respire through lungs.
 (2) Fish respire through gills.
 (3) Amphibia respire through moist skin.
 (4) Reptiles respire through dry thin skin.

142. Blood is filtered so finely through the filtration membrane, that almost all the constituents of the plasma except the proteins pass onto the lumen of the Bowman's capsule. Therefore, it is considered as a process of :-

- (1) Reabsorption (2) Ultrafiltration
 (3) Secretion (4) 2 and 3 both

143. **Assertion** : An excessive loss of fluid from body causes increased water reabsorption in DCT & therefore prevent diuresis.

Reason : Activation of osmoreceptors stimulate release of ADH (vasopressin).

- (1) Both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
 (2) Both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
 (3) Assertion is True but the Reason is False.
 (4) Both Assertion & Reason are False.

144. Blood vessel carrying least CO₂ is :-

- (1) Vena cava (2) Hepatic vein
 (3) Pulmonary vein (4) Pulmonary artery

145. Match the following columns :-

Column-I		Column-II	
(A)	Single blood circulation	(1)	Crocodile
(B)	Double blood circulation	(2)	Birds
		(3)	Fish
		(4)	Mammals

(1) A-1, 2 ; B-3, 4 (2) A-1, 2, 3 ; B-4

(3) A-1, 3, 4 ; B-2 (4) A-3 ; B-1, 2, 4

146. Given below two statements :-

Statement-I : Thoracic vertebrae, Ribs and Sternum together form the rib cage.

Statement-II : Last 2 pairs (11th and 12th) of ribs are not connected ventrally and are therefore called Floating ribs.

Choose the correct answer from the options given below :-

- (1) Both Statement I and Statement II are false
 (2) Statement I is true but Statement II is False
 (3) Statement I is false but statement II is True
 (4) Both Statement I and Statement II are True

147. Ion that stimulates entry of Ca⁺² in pre synaptic neuron :-

- (1) K⁺ (2) Ca⁺² (3) Na⁺ (4) Cl⁻

148. Find out the correct sequence of a simple reflex arc :-

- (1) Brain-spinal cord - nerves - effector
 (2) Effector - CNS - sensory nerve - receptor
 (3) Muscles - spinal cord - brain - receptor
 (4) Receptor - sensory nerve - CNS - effector

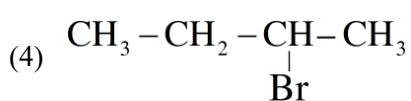
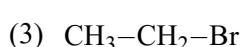
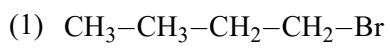
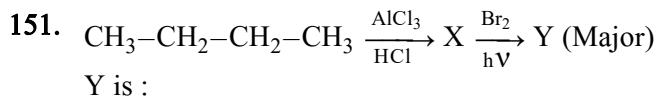
149. Progesterone hormone is secreted from :-

- (1) Placenta (2) Corpus luteum
 (3) Both 1 and 2 (4) Leydig cells

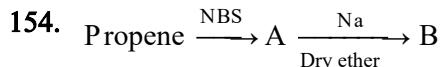
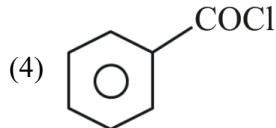
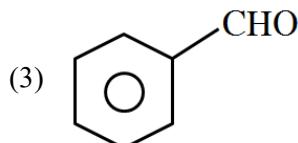
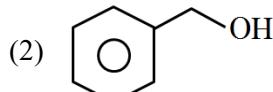
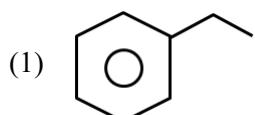
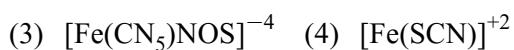
150. Which of the following is not paired correctly related to hyposecretion of hormones ?

- (1) Myxoedema - swollen facial tissues
 (2) Diabetes insipidus - Raises blood glucose
 (3) Parathyroid - tetany
 (4) Cretinism - mentally retarded

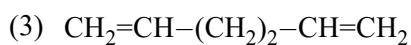
SECTION-A (CHEMISTRY)



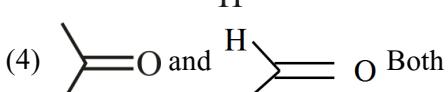
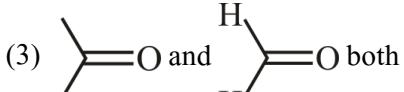
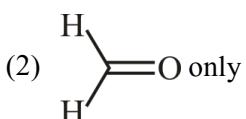
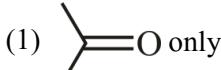
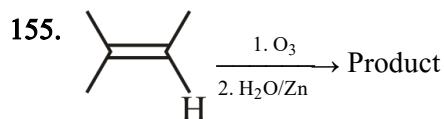
152. In the Lassaigne test for nitrogen in an organic compound the prussian blue colour is obtained due to the formation of :



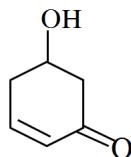
In the above reaction sequence the product B is :



(4) All of these

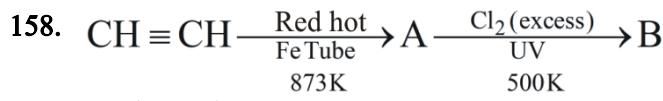
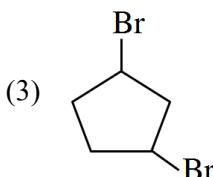
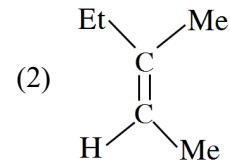
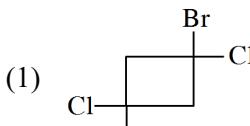


156. Group -OH present at the position of

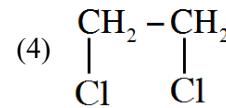
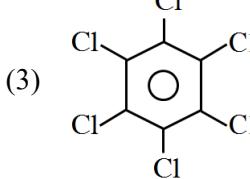
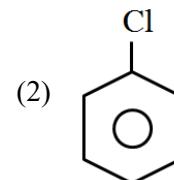
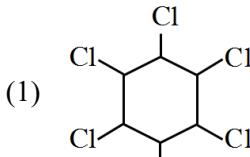


- (1) 1 (2) 3 (3) 4 (4) 5

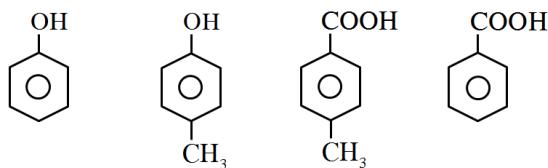
157. Which of the following can not show geometrical isomerism ?



Product B is :-



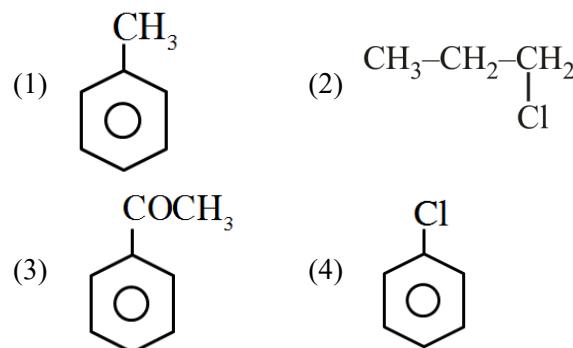
159. Complex acidic strength



- (A) (B) (C) (D)
- (1) A > C > D > B (2) D > A > C > B
 (3) D > C > A > B (4) D > C > B > A

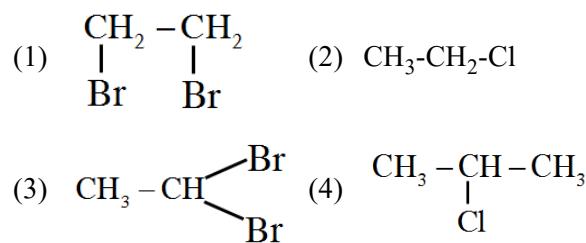
160. n-hexane $\xrightarrow[10-20\text{ atm}]{\text{Cr}_2\text{O}_3, 773\text{ K}}$ A $\xrightarrow[\text{Anhyd. AlCl}_3]{(\text{CH}_3\text{CO})_2\text{O}}$ B

Product B is

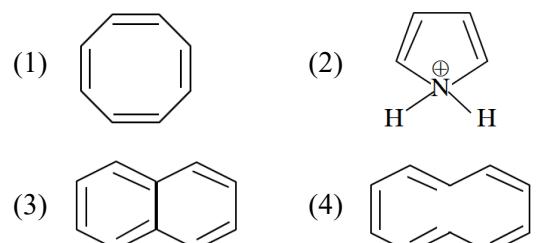


161. $\text{CH}_3-\text{CH}_2-\text{COONa} \xrightarrow[\Delta]{\text{NaOH}+\text{CaO}} \text{A} \xrightarrow[\text{hv}]{\text{Cl}_2} \text{B}$
 $\downarrow \text{Alc. KOH}$
 $\text{D} \leftarrow \xrightarrow{\text{Br}_2/\text{CCl}_4} \text{C}$

Product D is :-



162. Which of the following is Aromatic ?



163. Correct decreasing order of non-metallic character :-

- (1) C > N > F > B > Si (2) Si > B > C > N > F
 (3) F > N > C > B > Si (4) F > N > C > Si > B

164. In the modern periodic table, the Period indicates the value of

- (1) atomic number
 (2) atomic mass
 (3) principal quantum number
 (4) azimuthal quantum number

165. Assertion :- Ionisation energy of nitrogen is greater than oxygen.

Reason :- Size of nitrogen is less than oxygen.

- (1) Both Assertion and Reason are true but Reason is NOT the correct explanation of Assertion.
 (2) Assertion is true but Reason is false.
 (3) Assertion is false but Reason is true.
 (4) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

166. Correct decreasing order of bond Length

- (1) C – C > C = C > C – H > H – H
 (2) C = C > C – C > C – H > H – H
 (3) C – C > C – H > H – H > C = C
 (4) C – C > C – H > C = C > H – H

167. Which one is diamagnetic ?

- (1) S₂ (2) F₂ (3) NO (4) B₂

168. Which one is not Planar ?

- (1) BCl₃ (2) OF₂ (3) XeF₄ (4) NF₃

169. Which one do not have diagonal hybridisation ?

- (1) BeF₂ (2) C₂H₂ (3) XeF₂ (4) CO₂

170. Which of following are correct ?

- I - Li₂ is diamagnetic and exists in vapour phase
 II - SF₄ has a folded square shape
 III - BF₃ and NH₃ are polar
 IV - Electron gain enthalpy is always Exothermic
 (1) I,II,IV (2) I,IV (3) I,II (4) II,IV

171. How many molecules do not have complete octet in their central atom ?



- (1) 3 (2) 1 (3) 2 (4) 4

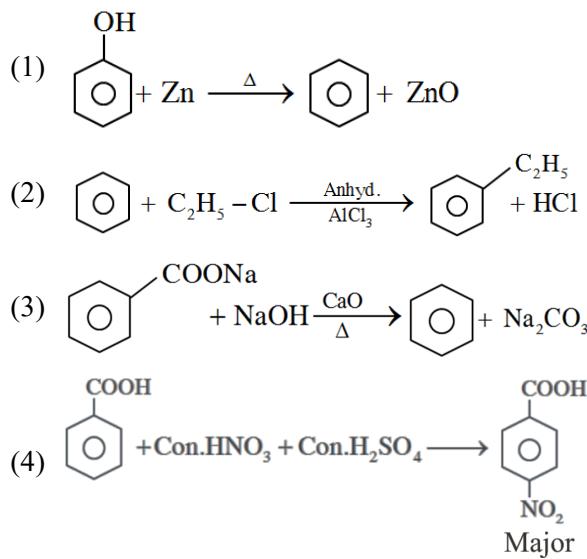
172. Which one have maximum number of π bond ?
 (1) dry ice (2) ethene
 (3) nitrous oxide (4) carbon suboxide
173. Which one does not exist ?
 (1) SiF_6^{-2} (2) GeCl_6^2 (3) ClF_7 (4) XeF_6
174. Which one has maximum ionic character ?
 (1) BeH_2 (2) MgH_2 (3) CaH_2 (4) BaH_2
175. Match List-I with List-II
- | | List-I | | List-II |
|-----|----------------------------------------|-------|-----------------------|
| (A) | 0.25 g atom of oxygen | (i) | 4g |
| (B) | 1 L of water | (ii) | N_A molecules |
| (C) | 2g eq. of H_2 | (iii) | $N_A/22.4$ molecules |
| (D) | 1 dm^3 of N_2 at STP | (iv) | 55.55 N_A molecules |
- Given T = 298 K;
 Molar volume of gas at STP = 22.4 L;
- (1) A → iv, B → i, C → iii, D → ii
 (2) A → i, B → iv, C → ii, D → iii
 (3) A → i, B → iii, C → ii, D → iv
 (4) A → i, B → ii, C → iii, D → iv
176. An organic compound contains 57.82% C, 3.6% H & 38.58% O. Find its empirical formula ?
 (1) $\text{C}_2\text{H}_4\text{O}_2$ (2) $\text{C}_3\text{H}_4\text{O}_3$
 (3) $\text{C}_4\text{H}_3\text{O}_2$ (4) $\text{C}_2\text{H}_3\text{O}_4$
177. For an isolated system
 (1) $w = 0$ (2) $q = 0$
 (3) $\Delta E = 0$ (4) All of these
178. In a vessel of 2L capacity 3 moles of N_2 reacts with 2 moles of O_2 to produce 1 mole of NO. What is the equilibrium constant for the reaction ?
 (1) 0.54 (2) 0.27 (3) 3.75 (4) 0.067
179. Which one of the following conditions will favour maximum formation of the product in the reaction $2\text{X}_{(\text{g})} + 3\text{Y}_{(\text{s})} \rightleftharpoons 3\text{Z}_{(\text{g})} + 110 \text{ kcal}$
 (1) 1000 atm & 500°C (2) 500 atm & 500°C
 (3) 1000 atm & 100°C (4) 500 atm & 100°C
180. Calculate the pH of an aqueous solution of 1M Ammonium formate assuming complete dissociation (pK_a of formic acid = 3.8 & pK_a of ammonia = 9.2)
 (1) 7.5 (2) 4.3 (3) 6.5 (4) 9.7
181. In which case pH will not change on dilution ?
 (1) 0.01 M $\text{CH}_3\text{COONa} + 0.01 \text{ M } \text{CH}_3\text{COOH}$
 (2) 0.1 M $\text{CH}_3\text{COONH}_4$
 (3) 0.01 M $\text{NH}_4\text{OH} + 0.01 \text{ M } \text{NH}_4\text{Cl}$
 (4) In all cases
182. The equivalent weight of H_3PO_4 in the given reaction is

$$\text{H}_3\text{PO}_4 + 3\text{NaOH} \rightarrow \text{Na}_3\text{PO}_4 + 3\text{H}_2\text{O}$$
 (1) $\frac{98}{3}$ (2) $\frac{98}{5}$ (3) $\frac{98}{2}$ (4) $\frac{98}{1}$
183. In which of the following oxidation number of Hydrogen is -1 in :-
 (1) NaH_2PO_4 (2) NaHSO_4
 (3) NaBH_4 (4) H_2
184. **Assertion :** KMnO_4 is a self Indicator
Reason : The visible end point is achieved after the last of the reductant is oxidised & the first testing tinge of pink colour appears at MnO_4^- concentration as low as 10^{-6} M
- (1) Both **Assertion** and **Reason** are true and **Reason** is the correct explanation of **Assertion**.
 (2) Both **Assertion** and **Reason** are true but **Reason** is NOT the correct explanation of **Assertion**.
 (3) **Assertion** is true but **Reason** is false.
 (4) **Assertion** is false but **Reason** is true.

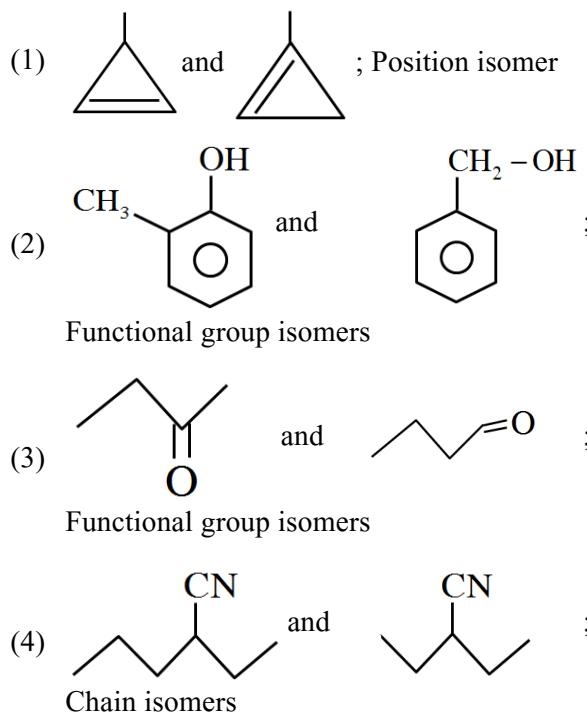
185. The heat of neutralisation of a strong acid & a strong Alkali is 57.2 kJ/equivalent. The heat released when 0.5 mol of HNO_3 solution is mixed with 0.4 mol of KOH is
- 11.4 kJ
 - 57 kJ
 - 22.88 kJ
 - 28.5 kJ

SECTION-B (CHEMISTRY)

186. Which of the following is incorrect ?



187. Which of the following is incorrect ?



188. $\text{CH}_3-\text{CHBr}-\text{CH}_2-\text{Br} + \text{Zn} \xrightarrow{\Delta} \text{A} \xrightarrow[\text{H}_2\text{O}/\text{Zn}]{\text{O}_3} \text{B} \& \text{C}$
In above reaction B & C are ?
- $\text{CH}_3-\text{CHO} \& \text{HCHO}$
 - $\text{CH}_3-\text{CHO} \& \text{HCOOH}$
 - $\text{CH}_3-\text{COOH} \& \text{CO}_2$
 - $\text{CH}_3-\text{COOH} \& \text{HCHO}$
189. Which of the following statement is correct about alkanes :
- They are coloured and soluble in water
 - Their boiling point decreases with the increment in molecular weight
 - They are colourless & odourless
 - None
190. Which statement is not true about halogenation of alkenes ?
- Geminal dihalide forms
 - Cyclic halonium ion forms as intermediate
 - Rearrangement of carbocation is not possible
 - Reaction with $\text{Br}_2 / \text{CCl}_4$ is used as a test of unsaturation.
191. Electronic configuration $(n-2)f^7(n-1)d^1ns^2$ belongs to which block ?
- s
 - p
 - d
 - f
192. Which of the following have minimum negative electron gain enthalpy ?
- O
 - S
 - Se
 - Te
193. Which of the following have minimum bond enthalpy ?
- F_2
 - B_2
 - C_2
 - N_2
194. Incorrect statement about Hydrogen bond
- Magnitude of hydrogen bond depends on physical state of molecule
 - Strength of one hydrogen bond in HF is less than H_2O
 - In NH_3 , present intermolecular Hydrogen bond is
 - Hydrogen bond is weaker than covalent bond

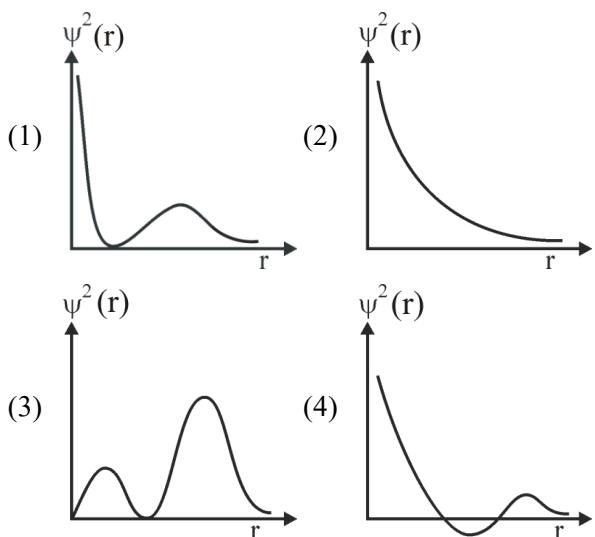
195. Which one does not have sigma bond ?

- (1) B_2 (2) N_2 (3) F_2 (4) O_2

196. Calculate the maximum K.E. of photoelectrons emitted when a light of frequency 1×10^{15} Hz is irradiated on a metal surface with threshold frequency (ν_0) equal to 8×10^{14} Hz.

- (1) 1.325×10^{-19} J (2) 6.626×10^{-19} J
(3) 132.5×10^{-19} J (4) 662.6×10^{-19} J

197. The probability density curve for 2s electron appears like



198. System is unable to do useful work when

- (1) $((\Delta G)_{\text{system}})_{T,P} = 0$
(2) $\Delta S_{\text{system}} + \Delta S_{\text{surrounding}} < 0$
(3) $(\Delta G)_{\text{system}})_{T,P} > 0$
(4) All of these

199. The solubility of CaF_2 in water at 20°C is 15.6 mg/dm^3 solution. What will be the solubility product of CaF_2 ?

- (1) 4×10^{-4} (2) 8×10^{-8}
(3) 32×10^{-12} (4) 2×10^{-4}

200. De-Broglie wavelength of 20 g ball moving with a velocity of 50 m/s is :

- (1) $6.626 \times 10^{-37} \text{ m}$ (2) $6.626 \times 10^{-34} \text{ m}$
(3) $1.5 \times 10^{-36} \text{ m}$ (4) $2.26 \times 10^{-34} \text{ m}$