CENTURION UNIVERSITY ENTRANCE EXAMINATION

CUEE - 2015

QUESTION BOOKLET

INSTRUCTIONS

Roll Number

Please read the following instructions carefully:

1. CUEE is a common entrance for the students aspiring to take admissions in B. Tech. (Regular), B. Tech. (Agril.Engg.) and B.Sc.(Ag.) courses of the University.

2. The test is of objective type. The candidates interested for B.Tech. (Regular) & B. Tech. (Agril.Engg.) have to answer EPCM section with a total of 180 questions.

   Section- I : English

   Section- II : Physics

   Section- III : Chemistry

   Section- IV : Mathematics

   Candidates interested for B.Sc.(Ag.) course are required to answer EPCB section with a total of 180 questions.

   Section- I : English

   Section- II : Physics

   Section- III : Chemistry

   Section- V : Biology

   The Total timing allotted is 3.00 hours.

3. Mention carefully your Roll Number, Question Booklet number in the OMR Answer Sheet and sign at the appropriate place. Write your Roll number on the question booklet.

4. Strictly follow the instructions given by the Centre Supervisor/ Room Invigilator and those given on the Question Booklet.

5. Please mark the answer ONLY with a Black/Blue ball point pen on the OMR Answer Sheet.

6. Candidates are not allowed to carry any papers, notes, books, log table, calculators or calculating devices, scanning devices, communication devices like cellular phone/pager/ducopen, etc. to the Examination hall. Any candidate found using, or in possession of 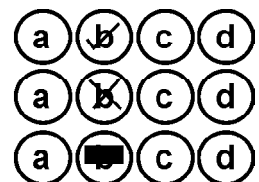such unauthorized material, indulging in copying or impersonation, adopting unfair means is liable to be summarily disqualified and may be subjected to penal action.

7. After finishing the examination, hand over the complete question booklet and OMR Answer Sheet to the Room Invigilator. DO NOT carry the question booklet or any part there of outside the examination room. Doing so, is a punishable offence.

8. Each objective type question is followed by four responses. Your task is to choose the correct/best response and mark your response by darkening the relevant CIRCLE with Black/Blue Ball Point Pen on the OMR Answer Sheet and do not on the Question Booklet.

9. All questions are COMPULSORY. There will be "No NEGATIVE MARKING".

10. Completely darken the CIRCLE so that the number inside the CIRCLE is not visible. Darken ONLY ONE CIRCLE for each answer as shown in the example below. The CORRECT and the WRONG method of darkening the CIRCLE on the OMR sheet is given below.

    CORRECT Method   **WRONG Method**

11. DO NOT make any stray marks anywhere on the OMR answer sheet. DO NOT fold or wrinkle the OMR answer sheet. Rough work MUST NOT be done on the answer sheet. Use your test booklet for this purpose.

12. In case you notice any questions missing in the question booklet, kindly bring it to the attention of the Invigilator.

Space for rough work

SECTION - I : ENGLISH

Choose the appropriate word/expression to complete the sentences:

1. You must abstain .... all alcoholic drinks.

   (A) of   (B) from   (C) to   (D) with

2. I do not approve...............your conduct.

   (A) by   (B) for   (C) of   (D) at

3. I have not seen him.............a month.

   (A) from   (B) for   (C) by   (D) in

4. When I .... (reach) the theatre, the film..............(start).

   (A) reached, had started
   (B) reached, started
   (C) reached, was starting
   (D) was reaching, started

5. All the students just....................... (leave) the class.

   (A) are leaving   (B) left
   (C) have left   (d) leave

6. She................. (watch) Television when her friend arrived.

   (A) was watching   (B) watched
   (C) would watch   (D) watches

7. Change the statement into indirect speech: She said, "I have not read this book".

   A. She told that I had not read this book.
   B. She said that she has not read this book.
   C. She told that she had not read that book.
   D. None of these

8. Change the voice: The students painted the picture.

   A. The picture painted by the students.
   B. The picture was painted by the students.
   C. The picture is painted by the students
   D. None of these

9. My father gave me...............one thousand rupee note.

   A. a   B. an
   C. the   D. No article

10. ....Mount Everest is the highest mountain in the world.

    A. a   B. an
    C. the   D. No article

11. Replace the underlined word with suitable phrasal verbs:
    Why did he reject my proposal?

    (A) turn off   (B) turn on
    (C) turn up   (D) turn down

12. A Government by the officials is...........

    (A) bureaucracy   (B) democracy
    (C) Autocracy   (D) Aristocratic

13. The king with his servants.................murdered.

    (A) was   (B) were
    (C) have   (D) none

14. The synonym of transform is..........

    (A) soft   (B) slow
    (C) change   (D) peace

15. Bondage is the antonym of.........

    A. Freedom   B. Pleasure
    C. Humble   D. Safety

16. Find out the error in the given sentence: Mark the particular section.

    (A) He is seeming/   (B) to/
    (C) be/   (D) happy

Read the passage and answer the questions that follow:

Laws of nature are not commands but statements of acts. The use of the word "law" in this context is rather unfortunate. It would be better to speak of uniformities in nature. This would do away with the elementary fallacy that a law implies a law giver. If a piece of matter does not obey a law of nature it is punished. On the contrary, we say that the law has been incorrectly started.
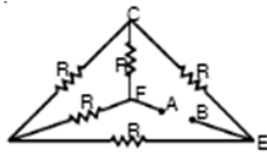
17. If a piece of matter violates nature's law, it is not punished because

    a) it is not binding to obey it
    b) there is no superior being to enforce the law of nature
    c) it cannot be punished
    d) it simply means that the facts have not been correctly stated by law

18. Laws of nature differ from man-made laws because

    a) the former state facts of Nature
    b) they must be obeyed
    c) they are natural
    d) unlike human laws, they are systematic

19. The laws of nature based on observation are

    a) conclusion about the nature of the universe
    b) true and unfalsifiable.
    c) figments of the observer imagination.
    d) subject to change in the light of new facts

20. The author is not happy with word 'law' because

    a) it connotes rigidity and harshness
    b) it implies an agency which has made them
    c) it does not convey the sense of nature's uniformity
    d) it gives rise to false beliefs

21. If he told me earlier, I................... (help) him.

    (A) will help
    (B) would help
    (C) would have helped
    (D) helped

22. India will win this match if...............................it (not rain).

    (A) it did not rain
    (B) it will not rain
    (C) it does not rain
    (D) it would not rain

23. He comes late everyday,.................?

    (A) do they?
    (B) did he?
    (C) didn't he?
    (D) doesn't he?

24. She cleared all the papers.........................?
    A. didn't she?
    B. does she?
    C. doesn't she?
    D. did she?

25. He is ....intelligent..........handsome.

    A. as, than
    B. both, and
    C. much, more
    D. as, but

26. BJP and Congress contested elections tooth and nail.

    A. in reality
    B. everywhere
    C. usually
    D. with full fury

27. He had to cut a sorry figure when the teacher told him to read a passage from the book and he could not read.

    A. not fit
    B. to be humiliated
    C. with happy
    D. repeated by

28. Which word is different?

    A. Ambulance
    B. Lorry
    C. Plane
    D. Van

29. Which word is different?

    A. Bank
    B. Cafe
    C. Hotel
    D. Restaurant

30. Which word is different?

    A. Camera
    B. Computer
    C. Office
    D. Television

SECTION - II : PHYSICS

31. The dimensional formula of angular momentum is

    (a) ML^2T^{-2} (b) MLT^{-2} (c) MLT^{-1} (d) ML^2T^{-1}

32. If $\left|\vec{A} x \vec{B}\right| = \left|\vec{B} x \vec{A}\right|$, then the angle between $\vec{A}$ and $\vec{B}$ is

    (a) π (b) $\pi/3$ (c) $\pi/2$ (d) $\pi/4$

33. The time period of a particle in simple harmonic motion is 8s. At t=0, it is at the mean position. The ratio of the distances travelled by it in the first and second seconds is

    (a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\frac{1}{\sqrt{2}-1}$ (d) $\frac{1}{\sqrt{3}}$

34. A ball 'A' of mass 'm' moving along positive x-direction with kinetic energy 'K' and momentum P undergoes elastic head on collision with a stationary ball B of mass 'M'. After collision the ball A moves along negative X-direction with kinetic energy K/9, Final momentum of B is
    (a) P   (b) P/3   (c) 4P/3   (d) 4P

35. A ball whose kinetic energy is E, is projected at an angle of 45^0 to the horizontal. The kinetic energy of the ball at the highest point of flight will be

    (a) E   (b) $\frac{E}{\sqrt{2}}$ (c) $\frac{E}{2}$ (d) zero

36. When a vibrating tuning fork is placed on a sound box of a sonometer, 8 beats per second are heard when the length of the sonometer wire is kept at 101 cm or 100 cm. Then the frequency of the tuning fork is (consider that the tension in the wire is kept constant)
    (a) 1616 Hz (b) 1608 Hz (c) 1632 Hz (d) 1600 Hz

37. A disk of radius 10 cm has a moment of inertia of 0.02 kg.m^2 about its central axis. A force of 15 N is applied tangentially to the periphery of the disk to give it an angular acceleration of magnitude
    (a) 25 rad/s^2 (b) 35 rad/s^2
    (c) 45 rad/s^2 (d) 75 rad/s^2

38. Sum of magnitudes of two forces acting at a point is 16N. if their resultant is normal to smaller force, and has a magnitude 8 N, then forces are
    (a) 6N, 10N   (b) 8N, 8N
    (c) 4N, 12N   (d) 2N, 14N

39. A car travelling with a speed of 60 km/h, can brake to stop within a distance of 20 m. If the car is going twice as fast, i.e., 120 km/h, the stopping distance will be
    (a) 20 m   (b) 40 m   (c) 60 m   (d) 80 m

40. If a body loses half of its velocity on penetrating 3 cm in a wooden block, then how much will it penetrate more before coming to rest?
    (a) 1 cm   (b) 2 cm   (c) 3 cm   (d) 4 cm

41. A particle moves along a straight line with a velocity given by the equation v=2t^3-t^2-2t+4 where v is the velocity in m/s and t the time in seconds. When t = 2 seconds, the particle is found to be at a distance of 10m from a station A. The acceleration of the particle after 6 seconds is given by
    (a) 202 m/s^2 (b) 12 m/s^2
    (c) 564.67 m/s^2 (d) 404 m/s^2

42. A spring balance is attached to the ceiling of a lift. A man hangs his bag on the spring and the spring reads 49 N, when the lift is stationary. If the lift moves downward with an acceleration of 5 ms^{-2}, the reading of the spring balance will be
    (a) 24 N   (b) 74 N   (c) 15 N   (d) 49 N

43. A particle performing uniform circular motion has an angular momentum L. If its angular frequency is doubled and its kinetic energy halved, then the new angular momentum is
    (a) L/4   (b) 2L   (c) 4L   (d) L/2

44. If g is the acceleration due to gravity at earth's surface and r is the radius of the earth, the escape velocity for the body to escape out of earth's gravitational field

    (a) gr   (b) $\sqrt{2gr}$ (c) $\frac{g}{r}$ (d) $\frac{r}{g}$

45. A wire fixed at the upper end stretches by length l by applying a force F. The work done in stretching is

    (a) $\frac{F}{2l}$ (b) Fl (c) $2Fl$ (d) $\frac{Fl}{2}$

46. Longitudinal waves cannot be propagated through

    (a) a gas   (b) a liquid   (c) vacuum   (d) a solid

47. The equation of state of a gas is given by $\left(P+\frac{\alpha}{v^3}\right)\left(V-b^2\right)=cT$, where P, V, T are pressure, volume and temperature respectively, and a, b, c are constants. The dimensions of a and b are respectively

    (a) ML^8T^{-2} and $L^{3/2}$ (b) ML^5T^{-2} and L^2

    (c) ML^5T^{-2} and L^6 (d) ML^6T^{-2} and $L^{3/2}$

48. A planet moves around the sun in an elliptical orbit with the sun at one of its foci. The physical quantity associated with the motion of the planet that remains constant with time is

   (a) velocity
   (b) centripetal force
   (c) linear momentum
   (d) angular momentum

49. A mass M at rest is broken into two pieces having masses m and (M-m). The two masses are then separated by a distance r. The gravitational force between them will be the maximum when the ratio of the masses [m:(M-m)] of the two parts is

   (a) 1 : 1   (b) 1 : 2   (c) 1: 3   (d) 1 : 4

50. A bullet on penetrating 30cm into its target loses its velocity by 50%. What additional distance will it penetrate into the target before it comes to rest?

   (a) 30 cm   (b) 20 cm   (c) 10 cm   (d) 5 cm

51. Water is flowing through a very narrow tube. The velocity of water below which the flow remains a streamline flow is known as

   (a) Relative velocity
   (b) Terminal velocity
   (c) Critical velocity
   (d) Particle velocity

52. In a slide callipers, (m+1) number of vernier divisions is equal to m number of smallest main scale divisions. If d unit is the magnitude of the smallest main scale division, then the magnitude of the vernier constant is

   (a) $\frac{d}{(m+1)}$ units
   (b) $\frac{d}{(m)}$ units
   (c) $\frac{md}{(m+1)}$ units
   (d) $\frac{(m+1)d}{(m)}$ units

53. Work done in increasing the size of a soap bubble from a radius of 3 cm to 5 cm is nearly(surface tension of soap solution = 0.03 Nm^{-1})

   (a) 4π mJ   (b) 0.2π mJ   (c) 2π mJ   (d) 0.4π mJ.

54. Two spheres of the same material have radii 1m and 4m and temperatures 4000K and 2000K respectively. The ratio of the energy radiated per second by the first sphere to that by the second is

   (a) 1:1   (b) 16:1   (c) 4:1   (d) 1:9

55. First law of thermodynamics is a consequence of the conservation of

   (a) charge   (b) heat   (c) energy   (d) momentum

56. A vessel contains a mixture of oxygen and hydrogen. The ratio of r.m.s. velocity of hydrogen to that of oxygen is

   (a) 4:1   (b) 16:1   (c) 1:32   (d) 32:1

57. A Carnot engine, having an efficiency of $\eta = \frac{1}{10}$ as heat engine, is used as a refrigerator. If the work done on the system is 10J, the amount of energy absorbed from the reservoir at lower temperature is

   (a) 99J   (b) 90J   (c) 1J   (d) 100J

58. At what temperature is the r.m.s. velocity of a hydrogen molecule equal to that of an oxygen molecule at 47^{0}C?

   (a) 80 K   (b) -73 K   (c) 3K   (d) 20 K

59. Two rods of equal length and area are joined in parallel and their conductivities are 4.5 and 3.5. What is the conductivity of the combination?

   (a) 3   (b) 2   (c) 6   (d) 4

60. Four charges equal to -Q are placed at the four corners of a square and a charge q is at its centre. If the system is in equilibrium, the value of q is

   (a) $\frac{-Q}{4}\left(1+2\sqrt{2}\right)$
   (b) $\frac{Q}{4}\left(1+2\sqrt{2}\right)$
   (c) $\frac{-Q}{2}\left(1+2\sqrt{2}\right)$
   (d) $\frac{Q}{2}\left(1+2\sqrt{2}\right)$

61. Which of the following materials is the best conductor of electricity?

   (a) Platinum
   (b) Gold
   (c) Silicon
   (d) Copper

62. Four capacitors of equal capacitance have an equivalent capacitance C_1 when connected in series and an equivalent capacitance C_2 when connected in parallel. The ratio $\frac{C_1}{C_2}$ is

   (a) ¼   (b) 1/16   (c) 1/8   (d) 1/12

63. Five equal resistance, each of resistance R, are connected as shown in figure below. A battery of V volt is connected between A and B. The current flowing in FC will be
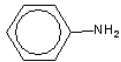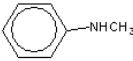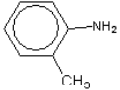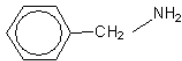

(a) $\frac{3V}{R}$ (b) $\frac{V}{R}$ (c) $\frac{V}{2R}$ (d) $\frac{2V}{R}$

64. How far apart must two protons be if the electrical repulsive force acting on either one is equal to its weight? ($m_p = 1.66 \times 10^{-27}$ kg)

(a) 0.119 cm   (b) 1.19 cm
(c) 11.9 cm   (d) none of these

65. A current carrying loop is placed in a uniform magnetic field. The torque acting on it , does not depend upon

(a) shape of the loop   (b) area of the loop
(c) value of current   (d) magnetic field

66. The magnetic field due to current carrying circular loop of radius 3cm at a point on the axis at a distance of 4 cm from the centre is 54µT. What will be its value at the centre of loop?

(a) 125µT   (b) 150µT   (c) 250µT   (d) 75µT

67. The current passing through a choke coil of 5H is decreased at the rate of 2 A/s. The induced e.m.f. in the coil is

(a) 2.5 V   (b) -2.5V   (c) 1.0V   (d) 10V

68. An ac source is rated at 220V, 50 Hz. The time taken for voltage to change from its peak value to zero is

(a) 50 sec (b) 0.02 sec   (c) 5 sec   d) 5×10^{-3} sec

69. Frequency of a wave is 6×10^{15} Hz. The wave is

(a) radio wave   (b) microwave
(c) X-ray   (d) ultraviolet

70. Two thin lenses of focal lengths 20 cm and 25 cm are placed in contact. The effective power of the combination is

(a) 9D   (b) 2D   (c) 3D   (d) 7D

71. In Young's double slit experiment the two slits are d distance apart. Interference pattern is observed on a screen at a distance D from the slits. A dark fringe is observed on the screen directly opposite to one of the slits. The wavelength of light is

(a) $\frac{D^2}{2d}$ (b) $\frac{d^2}{2D}$ (c) $\frac{D^2}{d}$ (d) $\frac{d^2}{D}$

72. The ionisation energy of hydrogen atom is 13.6 eV. The energy of an electron in the first excited state of hydrogen atom is :
(a) -3.4 eV   (b) +3.4 eV   (c) -6.8 eV   (d) +6.8 eV

73. The valence band and conduction band of a solid overlap at low temperature, the solid may be
(a) a metal   (b) a semiconductor
(c) an insulator   (d) none of these

74. A transistor is working in common emitter mode. Its amplification factor β =80. If the base current is 250µA, what is the current at the collector?
(a) 250µA (b) 250×80µA (c) 80µA (d) 200×80µA

75. In case of frequency modulation
(a) amplitude changes keeping frequency and phase constant
(b) frequency changes keeping amplitude and phase constant
(c) phase changes keeping amplitude and frequency constant
(d) amplitude, frequency and phase change

76. The impurity atom with which pure silicon should be doped to make a p-type semiconductor are those of
(a) phosphorus (b) boron (c) antimony (d) carbon

77. A radio can tune to any station in the 6 MHz to 15 MHz band. The corresponding wavelength band is
(a) 30 m to 55 m   (b) 25 m to 40 m
(c) 20 m to 50 m   (d) 25 m to 50 m

78. The half-life of phosphorus-32 is 15 days. 10 grams of phosphorus-32 will be reduced to 2.5 grams in
(a) 15 days   (b) 30 days
(c) 60 days   (d) none of these

79. The energy of a photon is 3×10^{-19} joule. Its momentum is
(a) 10^{-27} kg m s^{-1} b) 9×10^{-11} kg m s^{-1}
(c) 10^{-8} kg m s^{-1} d) 3×10^{17} kg m s^{-1}

80. In the nuclear reaction, $_{85}X^{297} \rightarrow Y + 4\alpha$, Y is

(a) $_{76}Y^{287}$ (b) $_{77}Y^{285}$ (c) $_{77}Y^{281}$ (d) $_{77}Y^{289}$

SECTION - III : CHEMISTRY

81. 0.5g of a metal on oxidation gave 0.79g of its oxide. The equivalent weight of the metal is

    (a) 10   (b)14   (c) 20   (d) 40

82. 3,3-dimethyl-2-butanol on reaction with HCl yields mainly

    (a) 2-chloro-2, 3-dimethylbutane
    (b) 1-chlore-2, 3-dimethylbutane
    (c) 2-chloro-3, 3-dimethylbutane
    (d) 1-chloro-3, 3-dimethylbutane

83. Which of the following sets of quantum numbers is permissible for an electron in an atom?

    (a) n=2, l=1, m=0, s=+1/2
    (b) n=3, l=1, m=-2, s=-1/2
    (c) n=1, l=1, m=0, s=+1/2
    (d) n=2, l=0, m=0, s = 1

84. Rosenmund's reaction can be used to obtain:

    (a) Alkanes   (b) Alkenes   (c) Alcohols   (d) Aldehydes

85. Bond order of O_2^- is

    (a) 2.5   (b) 1.5   (c) 2   (d) 0

86. A compound 'X' with molecular formula C_3H_8O can be oxidized to a compound 'Y' with the molecular formula $C_3H_6O_2$. 'X' is most likely to be a

    (a) Primary alcohol   (b) Sec- alcohol
    (c) Aldehyde   (d) Ketone

87. At Boyle's temperature, compressibility factor 'Z' for a real gas is

    (a) Z=1   (b) Z=0   (c) Z>1   (c) Z<1

88. The unit cell present in ABC ABC........Packing of atoms is

    (a) hexagonal   (b) tetragonal
    (c) face-centred cubic   (d) primitive cube

89. One mole of ice is converted into water at 273k. The entropies of $H_2O(s)$ and $H_2O(l)$ are 38.20 and 60.01J $mol^{-1} k^{-1}$ respectively. The enthalpy change for the conversion is

    (a) 59.54J mol^{-1} (b) 5954J mol^{-1}
    (c) 595.4J mol^{-1} (d) 320.6J mol^{-1}

90. Which of the following is a conjugate acid base pair?
    (a) HCl, NaOH   (b) NH_4Cl, NH_4OH
    (c) H_2SO_4, HS_4^- (d) KCN, HCN

91. In the precipitation of III group in qualitative analysis, NH_4Cl is added before NH_4OH to :

    (a) Decrease concentration of OH^- ions
    (b) Decrease concentration of PO_4^{3-} ions
    (c) Increase the concentration of NH_4^+ ions
    (d) None

92. The molar conductance of HCl, NaCl and CH_3COONa are 462,126, and 91 $Ohm^{-1} cm^2 mol^{-1}$ respectively. The molar conductance for CH_3COOH is

    (a) 561 Ohm $\Omega^{-1} cm^2 mol^{-1}$
    (b) 391 Ohm $\Omega^{-1} cm^2 mol^{-1}$
    (c) 261 Ω $Ohm^{-1} cm^2 mol^{-1}$
    (d) 612 Ω $Ohm^{-1} cm^2 mol^{-1}$

93. The charge required for the reduction of 1 mol of $K_2Cr_2O_7$ to Cr^{3+} ion is

    (a) 0.6 faraday   (b) 2.4 x96500C
    (c) 6 x96500C   (d) 12.4 x96500F

94. A radioactive element has a half life period of 140 days. How much of it will remain after 1120 days.

    (a) 1/32   (b) 1/250   (c) 1/512   (d) 1/128

95. The specific reaction rate constant for a first order reaction is $1x10^{-3}$ sec^{-1}. If the initial conc. of reactant is 1 mole per litre, the rate is

    (a) 10^{-4} M sec^{-1} (b) 10^{-3} M sec^{-1}
    (c) 10^{-2} M sec^{-1} (d) 10^{-1} M sec^{-1}

96. The number of α and β particles emitted in the nuclear reaction $_{90}Th^{228}$ to $_{83}Bi^{212}$ are
    (a) 4 α and 1 β (b) 3 α and 7 β
    (c) 8 α and 1 β (d) 4 α and 7 β

97. Gold number is a measure of :
    (a) Stability of colloidal system
    (b) Coagulating power of a colloid
    (c) Size of colloidal particles
    (d) Efficiency of the protective colloid

98. Which of the following is the strongest base?

(a) [benzene ring]–NH_2

(c) [benzene ring]–NH_2 with –CH_3

(b) [benzene ring]–$NHCH_3$

(d) [benzene ring]–CH_2–NH_2

99. Lunar caustic is

(a) NaOH (b) KOH (c) $Ba(OH)_2$ (C) $AgNO_3$

100. What is the oxidation state of iron in $K_3[Fe(CN)_6]$?

(a) +2 (b) +3 (c) +4 (d) -3

101. Reimer-Tiemann reaction involves a
    (a) Carbonium ion intermediates
    (b) Carbene intermediate
    (c) Carbanion intermediate
    (d) Free radical intermediate

102. IUPAC name of Gammexene is
    (a) Hexachlorobenzene
    (b) Benzene Hexachloride
    (c) 1,2,3,4,5,6-Hexachlorocyclohexane
    (d) None of these

103. The pH of 10^{-8} M HCl solution is

(a) 8 (b) 6 (c) 6.98 (d) 7.02

104. The order of reactivity of various alkyl halides towards
    SN_1 reaction is
    (a) $3^0 > 2^0 > 1^0$ (b) $1^0 > 2^0 > 3^0$
    (c) $3^0 = 2^0 = 1^0$ (d) $1^0 > 3^0 > 2^0$

105. Which of the following compounds on oxidation gives
    benzoic acid?
    (a) Chlorophenol   (b) Chlorotoluene
    (c) Chlorobenzene   (d) Benzyl Chloride

106. When ethyl alcohol is distilled with concentrated
    sulphuric acid under reduced pressure, the product
    is
    (a) Ethyl hydrogen sulphate
    (b) Ethylene
    (c) Diethyl sulphate
    (d) Diethyl ether

107. Which of the following ketone will not respond to
    iodoform test?
    (a) 3-Methylbutan-2-one (b) Ethyl isopropylketone
    (c) Methyl phenyl ketone (d) Dimethyl ketone

108. Solubility of $Ca(OH)_2$ is 'S' mol L^{-1}. The solubility
    product (K_{sp}) under the same condition is

(a) $4S^3$ (b) $3S^4$ (c) $4S^2$ (d) S^3

109. Ethanal is treated with ammonia and adduct formed
    is warmed. The final product is
    (a) Acetaldehyde ammonia
    (b) Acetaldimine
    (c) Tetramethylene hexamine
    (d) Ethyl amine

110. The compound with a formula H_2NCH_2COOH behave
    as
    (a) Strong acid
    (b) Strong base
    (c) Amphoteric substance
    (d) Strong reducing agent

111. The mixture of formic acid and acetic acid vapours
    are passed over heated manganous oxide at 575 K.
    The main product is
    (a) Ethyl ethanoate
    (b) Methyl formate
    (c) Acetone
    (d) Acetaldehyde

112. Which of the following acid can show optical
    isomerism?
    (a) 2,2-Dimethylpropanic acid
    (b) 2-methylpropanoic acid
    (c) 2-methylbutanoic acid
    (d) Ethanoic acid

113. Acetamide changes into methylamine by
    (a) Hofmann bromide reaction
    (b) Hofmann reaction
    (c) Friedal-Craft's reaction
    (d) Hinsberg reaction

114. Which of the following reagent can be used to convert
    benzene diazonium chloride to benzene?
    (a) Phosphorus acid
    (b) Phosphoric acid
    (c) Hypophosphoric acid
    (d) Metaphosphoric acid

115. Which of the following will give primary amine on
    hydrolysis
    (a) Nitroparaffin
    (b) Alkyl cyanide
    (c) Oxime
    (d) Alkyl isocyanide

116. Which of the following is a condensation polymer?
    (a) Polystyrene
    (b) Neoprene
    (c) PAN
    (d) Nylon-6, 6

117. Insulin is
    (a) Hormone
    (b) Vitamin
    (c) Antibiotic
    (d) Antiseptic

118. Teflon is a polymer of
    (a) Tetrafluoroethylene
    (b) Tetraiodoethylene
    (c) Tetrabromoethylene
    (d) Tetrachloroethylene

119. Recently discovered allotrope of Carbon is
    (a) Diamond
    (b) Graphite
    (c) Fullerene
    (d) Carbon Nano Tube

120. Ferric ion forms a Prussian blue coloured ppt. Due to the formation of
    (a) $K_4[Fe(CN)_6]$
    (b) $Fe_4[Fe(CN)_6]_3$
    (c) $KMnO_4$
    (d) $Fe(OH)_3$

121. The presence of NH_4^+ radical in solution can be detected by
    (a) Fehling's solution
    (b) Benedict's solution
    (c) Schiff's reagent
    (d) Nessler's reagent

122. Blue borax bead is given by

    (a) Zn (b) Cobalt (c) Chromium (d) Fe

123. In which, addition does not occur according to Markownikov's rule
    (a) $CH_3CH = CH_2 + HCl \underrightarrow{ROOR}$,

    (b) $CH_3CH = CH_2 + HBr \underrightarrow{ROOR}$,

    (c) $CH_3CH = CHCH_3 + HBr \underrightarrow{ROOR}$,

    (d) $CH_2 = CH_2 + HI \underrightarrow{ROOR}$

124. For an ionic solid of general formula AB and coordination number 6, the value of the radius ratio will be
    (a) less than 0.225
    (b) In between 0.225 and 0.414
    (c) In between 0.414 and 0.732
    (d) Greater than 0.732

125. Example of a basic buffer is

    a) mixture of HCl & CH_3COONa
    b) mixture of CH_3COOH & CH_3COONa
    c) mixture of NH_4OH & NH_4Cl
    d) mixture of NaOH & NaCl

126. Permanent hardness of water is due to the presence of

    a) Chlorides of Calcium and Magnesium
    b) Sulphates of Calcium and Magnesium
    c) Chlorides &sulphates of Calcium and Magnesium
    d) Chlorides, Sulphates, Carbonates and Bicarbonates of Calcium and Magnesium

127. Lanthanide contraction is caused due to

    a) The imperfect shielding on outer electrons by 4f electrons from the nuclear charge
    b) The appreciable shielding on outer electron by 4f electrons from the nuclear charge
    c) The appreciable shielding on outer electron by 5d electrons from the nuclear charge
    d) The same effective nuclear charge from Ce to Lu

128. IUPAC name of $CH_2=CH-CH_2-C \equiv CH$ is:

    a) pent-1-en-4-yne
    b) pent-4-en-1-yne
    c) pent-4-yn-1-ene
    d) pent-1-yn-4-en

129. The reaction $CH_3-CH(Br)-CH_3 + KOH$ (alcoholic) $\rightarrow$ $CH_2=CH_2 + KBr + H_2O$

    a) rearrangement reaction
    b) addition reaction
    c) substitution reaction
    d) elimination reaction

130. The main Green House gas is

    a) Oxygen
    b) Nitrogen
    c) Carbon Monoxide
    d) Carbon dioxide

131. If $A \subset B$ then
   (a) $A \cup B = A$ (b) $A \cup B = B$
   (c) $A \cap B = B$ (d) $A \cap B = \phi$

132. The number of elements of $P\,(P\,(P\,(P\,(\phi))))$ is
   (a) 2   (b) 4   (c) 8   (d) 16

133. The relation R = {(a,b), (b,a) (a,c), (c,a), (a,a), (b,b), (c,c)} is
   (a) reflexive, symmetric and transitive
   (b) reflexive, not symmetric and transitive
   (c) reflexive, symmetric and not transitive
   (d) not reflexive, symmetric and transitive

134. If $iZ^3 + Z^2 - Z + i = 0,\ then\ |Z| =$ _____.
   (a) 1   (b) i   (c) -1   (d) -i

135. The value of the $\sum_{n=1}^{13}\left(i^n + i^{n+1}\right)\left(where\ i = \sqrt{-1}\right) =$ __.
   (a) i   (b) i - 1   (c) - i   (d) 0

136. If $Z_1,\ Z_2,\ Z_3$ are complex numbers such that
   $|Z_1| = |Z_2| = |Z_3| = \left|\dfrac{1}{z_1} + \dfrac{1}{z_2} + \dfrac{1}{z_3}\right| = 1$
   then $|z_1 + z_2 + z_3|$ is
   (a) equal to 1   (b) less than 1
   (c) greater than 3   (d) equal to 3

137. The value of x for which the quadratic polynomial $3x^2 - 4x + 11$ is minimum is _____
   (a) -2/3   (b) 2/3   (c) -1/3   (d) 1/3

138. If $1, \omega, \omega^2$ are the cube roots of unity, then the value
   of the determinant $\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix}$ is _____
   (a) 0   (b) ω (c) ω^2 (d) 1

139. The value of the determinant $\begin{vmatrix} x & a & a \\ m & m & m \\ b & x & b \end{vmatrix}$ is _____
   (a) -2   (b) -1   (c) 0   (d) 1

140. The inverse of the matrix $\begin{bmatrix} 4 & -2 \\ 3 & 1 \end{bmatrix}$ is
   (a) $\begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}$ (b) $\begin{bmatrix} 4 & 2 \\ 3 & 1 \end{bmatrix}$
   (c) $\dfrac{1}{10}\begin{bmatrix} 1 & 2 \\ -3 & 4 \end{bmatrix}$ (d) $\dfrac{1}{10}\begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix}$

141. If A is a square matrix, then $A + A^T$ is a
   a) diagonal matrix   b) symmetric matrix
   c) skew-symmetric matrix   d) none of these

142. How many two digit even numbers of distinct digits can be formed with the digits 1, 2, 3, 4, 5?
   (a) 4   (b) 8   (c) 12   (d) 16

143. In how many ways can two boys and three girls sit in a row so that no two girls sit side by side?
   (a) 8   (b) 10   (c) 12   (d) 16

144. In how many ways can a student choose 5 courses out of 9 if 2 courses are compulsory?
   (a) 25   (b) 35   (c) 50   (d) 70

145. $\dfrac{1}{1.2} + \dfrac{1}{2.3} + ... \dfrac{1}{n(n+1)} =$
   (a) $\dfrac{n}{n+1}$ (b) $\dfrac{n}{n-1}$ (c) $\dfrac{n+1}{n-1}$ (d) $\dfrac{n-1}{n+1}$

146. The contrapositive of the proposition "Sum of two odd integers is even" is
   a) If two integers are odd, then their sum is even.
   b) If two integers are not odd, then their sum is not even.
   c) If the sum of two integers is not even then they are not odd.
   d) None of these

147. The equation of the straight line which passes through (1, 2) and is perpendicular to the line $y = x$ is ____.
   (a) x+y-2=0   (b) x-y+1=0   (c) x-y-1=0   (d) y+x-3=0

148. If a tangent to the parabola $y^2 = 8x$ makes an angle $\pi/4$ with the straight line $y = 3x + 5$, then the point of contact is
   (a) $\left(\dfrac{1}{2},2\right)$ (b) $(0,2)$ (c) $\left(\dfrac{1}{2},-2\right)$ (d) $\left(-\dfrac{1}{2},2\right)$

149. On the ellipse $4x^2 + 9y^2 = 1$, the points at which the tangents are parallel to the line $8x = 9y$ are

(a) $\left(\dfrac{2}{5}, \dfrac{1}{5}\right)$

(b) $\left(-\dfrac{2}{5}, \dfrac{1}{5}\right)$

(c) $\left(\dfrac{2}{5}, -\dfrac{1}{5}\right)$

(d) None of these

150. Let f be a function which is continuous and differentiable for all real x.

If $f(2) = -4$ and $f^1(x) \geq 6 \,\forall x \in [2,4]$, then

(a) $f(4) < 8$

(b) $f(4) \geq 8$

(c) $f(4) \geq 12$

(d) None of these

151. The real number x when added to its inverse gives the maximum value of the sum at x = _____.

(a) 2

(b) 1

(c) -1

(d) -2

152. If x, y, z are positive numbers, then

a) (x+y)(y+z)(z+x)>2xyz

b) (x+y)(y+z)(z+x)>4xyz

c) $(x+y)(y+z)(z+x) \geq 8xyz$

d) None of these

153. Real numbers can be expressed by _____.

a) only terminating decimals

b) only non-terminating recurring decimals

c) either by terminating or non-terminating decimals

d) None of these

154. For $x \in R$, $\lim\limits_{x \to \infty} \left(\dfrac{x-3}{x+2}\right)^x =$ _____

(a) e

(b) e^{-1}

(c) e^{-5}

(d) e^5

155. If $y = \left(x + \sqrt{1+x^2}\right)^n$, then $\left(1+x^2\right)\dfrac{d^2y}{dx^2} + \dfrac{dy}{dx}$ is

(a) n^2y

(b) $-n^2y$

(c) $-y$

(d) $2x^2y$

156. If $x^y = e^{x-y}$ then $\dfrac{dy}{dx}$ is _____

a) $\dfrac{1+x}{1+\log x}$

b) $\dfrac{1-\log x}{1+\log x}$

c) Not defined

d) $\dfrac{\log x}{\left(1+\log x\right)^2}$

157. If $x^2 + y^2 = t + \dfrac{1}{t}$ and $x^4 + y^4 = t^4 + \dfrac{1}{t^2}$, then $\dfrac{dy}{dx}$ is equal to _____

(a) y/x

(b) -y/x

(c) x/y

(d) -x/y

158. Let f and g be differentiable functions satisfying $g^1(a)=2$, $g(a)=b$ and $fog = I$ (Identity function). Then $f^1(b)$ is equal to

(a) 2

(b) 2/3

(c) 1/2

(d) None of these

159. The points on the curve $y^2 = 4a\left(x + a\sin\dfrac{x}{a}\right)$ at which the tangent is parallel to x - axis, lie on

a) a straight line

b) a parabola

c) a circle

d) an ellipse

160. The maximum value of $(x-p)^2+(x-q)^2+(x-r)^2$ will be at x =

(a) $\dfrac{p+q+r}{3}$

(b) $3\sqrt{qprc}$

(c) qpr

(d) $p^2+q^2+r^2$

161. The curve $y = ax^3 + bx^2 + cx + 5$ touches the x-axis A(-2,0) and cuts the y-axis at a point B where its slope is 3. The values of a, b and c are

a) a=1/2, b= -3/4, c= 3

b) a = -1/2, b = -3/4, c = 3

c) a=1/2, b=3/4, c=3

d) None of these

162. The number of vectors of unit length perpendicular to vectors $\vec{a} = (1,1,0)$ and $\vec{b} = (0,1,1)$ is

(a) one

(b) Two

(c) Three

(d) Infinite

163. $\int e^x (\cos x + \sin x) dx$ is equal to:

a) $e^x \sin x + C$

b) $e^x \cos x + C$

c) $-e^x \sin x + C$

d) None of these

164. $\int \dfrac{e^x(1+x)}{\sin^2(xe^x)} dx$ is equal to:

a) $\tan(e^x) + C$

b) $x \tan(e^x) + C$

c) $\cot(xe^x) + C$

d) $-\cot(xe^x) + C$

165. The value of $\int\limits_0^2 |1-x| dx$ is equal to

(a) -1

(b) 1

(c) 0

(d) 2

166. $\int \dfrac{x^{24}}{x^{10}+1} dx$ is equal to:

a) $\dfrac{1}{5}\left(\dfrac{x^{15}}{3} - x^5 + \tan^{-1}(x^5)\right) + C$

b) $\dfrac{1}{5}\left(\dfrac{x^{15}}{3} - x^5 - \tan^{-1}(x^5)\right) + C$

c) $\dfrac{1}{5}\left(\dfrac{x^{15}}{3} + x^5 + \tan^{-1}(x^5)\right) + C$

d) None of these

167. $\int \dfrac{1}{\sin(x-a)\sin(x-b)}\,dx$ is equal to:

   a) $\sin(a+b)\log\dfrac{\sin(x-a)}{\sin(x-b)} + C$

   b) $\sin(a-b)\log\dfrac{\sin(x-a)}{\sin(x-b)} + C$

   c) $\dfrac{1}{\sin(a+b)}\log\dfrac{\sin(x-a)}{\sin(x-b)} + C$

   d) $\dfrac{1}{\sin(a-b)}\log\dfrac{\sin(x-a)}{\sin(x-b)} + C$

168. $\int \dfrac{1}{\sin^2 x+\sin 2x}\,dx$ is equal to:

   a) $\log\left(\dfrac{\tan x}{\tan x+2}\right) + C$

   b) $\dfrac{1}{2}\log\left(\dfrac{\tan x}{\tan x+2}\right) + C$

   c) $\dfrac{1}{2}\log\left(\dfrac{\tan x}{\tan x-2}\right) + C$

   d) None of these

169. $\displaystyle\int_0^2 \dfrac{2^{x+1}-3^{x-1}}{6^x}\,dx$ equals to

   a) $\log_3 e - \log_2 e$

   b) $\dfrac{4}{3}\log_3 e - \dfrac{1}{6}\log_2 e$

   c) $\dfrac{4}{3}\log_3 e + \dfrac{1}{6}\log_2 e$

   d) None

170. $\displaystyle\int_{-8}^8 \left(\sin^{93} x + x^{295}\right)\,dx$ is equal to

   (a) 0

   (b) a number different from 0

   (c) $2[8^{290}+1]$

   (d) $8^{295}+2$

171. The minimum value of $e^{\left(x^4-x^3+x^2\right)}$ is

   (a) e   (b) e^2 (c) 1   d) None of these

172. The area of the ellipse $\dfrac{x^2}{a^2}+\dfrac{y^2}{b^2}=1$ is

   (a) $4\pi ab$ (b) $2\pi ab$ (c) πab (d) $\pi^2 ab$

173. The area enclosed by the parabola $ay = 3(a^2 - x^2)$ is

   a) $16\,a^2$sq. units   b) $4a^2$sq. units
   c) $64\,a^2$sq. units   d) a^2sq. units

174. If $lx+my+3=0$ and $3x-2y-1=0$ represent the same line, find the values of l and m

   a) $l = 9$, $m = 6$ b) $l = 6$, $m = 6$
   c) $l = 6$, $m = 9$ d) $l = 9$, $m = 9$

175. The equation of the circle passing through the point $(1,-2)$ and having its centre at the point of intersection of lines $2x-y+3=0$ and $x+2y-1=0$ is

   (a) $(x-1)^2+(y-1)^2=13$ (b) $(x+1)^2+(y-1)^2=13$
   (c) $(x+1)^2+(y+1)^2=13$ (d) None of these

176. The value of $\dfrac{\cos 11^0 + \sin 11^0}{\cos 11^0 - \sin 11^0}$ is

   a) $\tan 45^0$ b) $\cot 11^0$
   c) $\tan 56^0$ d) $\tan 60^0$

177. The value of $\cos(2\sin^{-1} x)$ is

   (a) $\dfrac{1}{9}$ (b) $\dfrac{2}{9}$ (c) $\dfrac{-1}{9}$ (d) $\dfrac{-2}{9}$

178. What is the order and degree of the differential equation $\left[1+\left(\dfrac{dy}{dx}\right)^2\right]^3 = c^2\left(\dfrac{d^2y}{dx^2}\right)^2$

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

179. The probability of getting heads in both trials, when a balanced coin is tossed twice, will be

   (a) $\dfrac{1}{4}$ (b) $\dfrac{1}{2}$ (c) $\dfrac{2}{3}$ (d) $\dfrac{3}{4}$

180. Two dice are thrown. The probability that the sum of the points on two dice will be 7 is

   (a) $\dfrac{5}{36}$ (b) $\dfrac{6}{36}$ (c) $\dfrac{7}{36}$ (d) $\dfrac{8}{36}$

181. Assertion (A): pBR 322 is a popular vector in genetic engineering
Reason (R): It can be in serted into any organism
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true and R is not the correct explanation of A.
(c) A is true but R is false
(d) A is false but R is true

182. Arrange the following in ascending order on the basis of their matric potential values when they are placed in water
I. Cell of rice grains
II. Cell of pea seeds
III. Turgid living parenchymatous cell
IV. Cork cells of a tree specier.

(a) I,II,III, IV   (b) II,I, III, IV
(c) III,I, II,IV   (d) IV,III,I,II

183. Study the following table with respect to funaria. Which components of the given table shows correct combination.

List - I	List - II	List - III
I) Trabeculae	capsule	apophysis region
II) Hydroids	stem	central cylinder region
III) Spores	haploid	venter of archegonium
IV) Paraphysis	terminal	antheridial branch

(a) I and II   (b) II and III   (c) III and IV   (d) II and IV

184. Match the following

List - I	List - II
A. Exomicrobiology	I. use of microbes in controlling plant diseases and pests
B. Biagos	II. Manufacture of diary products by using microbes
C. Biacontrol	III. Mixture of gases produced by microbes which is used as fuel
D. Genetic engineering	IV. Altering genetic makeup of an organism.
	V. Using of microbes for the exploration of life in the outer space.

The correct match

	A	B	C	D
(a)	III	I	V	II
(b)	II	III	IV	I
(c)	V	III	I	IV
(d)	I	II	III	V

185. Pathogenecity of bacteria causing tuberculosis and leprosy is due to

(a) Cholesterol
(b) Wax -D
(c) Prostaglandins
(d) Glycerol

186. Which one of the following viruses contain both DNA and RNA?

(a) Herpes virus   (b) Leuko virus
(c) Cyanophage   (d) Poloivirus

187. Identify the incorrect sporangial character of Pteris

(a) Development of sporangium in Pteris is Eusporangiate
(b) The capsule of the sporangium in pteris covered by one or two jacket
(c) A small group of long, flat, thin walled cells lying between the stalk and the end of annulus of stomium
(d) Cleavage of the sporangium is at stomium cells.

188. The characteristics feature of the cycas foliage leaf are
i. Foliage leaves in Cycas are commonly unipinnately compound.
ii. Leaf basis in Cycas are - Rhomboidal leaf bases
iii. Young leaflets of Cycas show - Circinate vernation.
iv. Leaves in Cycas shoe - Habitual heterophylly

(a) i,iii are correct   (b) i,ii,iii are correct
(c) i,ii,iii,iv are correct   (d) i,ii correct

189. Nematode involved in transmission of some soil borne viral disease is/are

(a) Olphidium   (b) Xiphinema
(c) Longidorus   (d) Both 2 and 3

190. Assign the following substances to the cell wall,flagella's layer and pili of bacteria in correct sequence.
I. Glycoprotein   II. Fimbrilin
III. Teichoic acid   IV. Flagellin

(a) III,I,IV,II   (b) III,IV,I,II   (c) II,IV,III,I   (d) III,IV,II,I

191. In a flaccid cell, which of the following remains zero

(a) Turgor pressure   (b) Chemical potential
(c) Osmotic potential   (d) Eosinecolour

192. Identify the correct order of the events in Active transport

a) Counter transport $\rightarrow$ uiport $\rightarrow$ Symport
b) Uniport $\rightarrow$ Antiport $\rightarrow$ Symport
c) Antiport $\rightarrow$ Symport $\rightarrow$ Uniport
d) Uniport $\rightarrow$ Symport $\rightarrow$ Counter transport

193. Match the following

	Enzyme	pH value
A.	Trypsin	i) 5.0
B.	Amylase	ii) 2.0
C.	Pepsin	iii) 7.0
D.	Peroxidase	IV) 8.0
		V) 6.0

The correct match

	A	B	C	D
a)	II	I	III	IV
b)	IV	III	II	I
c)	I	II	III	IV
d)	II	I	IV	III

194. Molecular formula of chlorophyll-a is

(a) $C_{55}H_{70}O_5N_4Mg$ (b) $C_{55}H_{72}O_6N_4Mg$
(c) $C_{55}H_{72}O_5N_4Mg$ (d) $C_{55}H_{70}O_6N_4Mg$

195. The net requirement of assimilatory power for the formation of 6 hexose molecules in maize plant is

(a) 72 ATP, 48 NADPH (b) 90 ATP, 60 NADPH
(c) 108 ATP, 72 NADPH (d) 180 ATP, 72 NADPH

196. Four carbons compound of Kreb's cycle are
I) Citric acid II) Malic acid
III) α-KetoGlutaricAcid IV) Succinic Acid
The correct combination is
(a) II & IV are correct
(b) I & III are correct
(c) II & III are correct
(d) I & IV are correct

197. The overall reaction of biological

(a) $N_2 + 6e^- + 6H^+ + 6ATP-2NH_3 + 6 ADP+6Pi$

(b) $N_2 + 8^- + 8H^+ + 8ATP-2NH_3 + 8 ADP+8Pi$

(c) $N_2+8e^- + 8H^+ + 16ATP-2NH_3 + H_2+16 ADP+16Pi$

(d) $N_2+8e^-+8H^+ + 10ATP-2NH_3 + H_2+10ADP+10Pi$

198. Identify the wrong statement from the following
(a) Mass propagation of plants through tissue culture is called micropropagation
(b) Plant regenerated through tissue culture show somaclonal variations
(c) Viral free clones are obtained by root-tip culture of viral infected plants
(d) Incapsulated somatic embroyos can be stored, germinated and transported

199. Which method of plant breeding resulted in the production of "Hessiann Fly Resistant" wheat variety?
(a) Intra generic hybridization (b) Back cross
(c) Bulk Method (d) Intra specific Hybridisation

200. Genetic material is naked in

A. Escherichia coli B. Streptomyces
C. Saccharomyces D. Alternaria

(a) A & B (b) B & C (c) A, B & C (d) A,B,C & D

201. Synchronization of pollen and pistil maturation takes place in
(A) Viola (B) Oxalis
(C) Commelina (D) Solanum

(a) A, B, C (b) Only C (c) Only D (d) A, C

202. Arrange the following plants in the increased order of the curvature seen in their ovule
(A) Plumbago (B) Ranunculus (C) Dolichos
(D) Alisma (E) Polygonum (F) Tridax

(a) E-----B----C-----D------F-----A
(b) A----F-----D----C-----B----E
(c) E-----B----D----C-----F-----A
(d) A----F-----B----B-------C----E

203. True statement among the following
I. All cells of nucellus forms into archesporial cells.
II. Archesporial cell can directlydevelop into spore mother cell.
III. Parietal cell sometimes develop into spore mother cell.

(a) I & II (b) Only II (c) I & III (d) II & III

204. True statement among the following
I. Contractile vacuoles are present in plants
II. Function of vacuoles in plant is excretion
III. Vacuole is bounded by single membrane
IV. Vacuole store food material

(a) I & II (b) II & III (c) Only III (d) III & IV

205. Match the following

List - A	List - B
A. Streptocarpus	I. Dichogamy
B. Clerodendron	II. Herkogamy
C. Passiflora	III. Cleistogamy
D. Hibiscus	IV. Dicliny
	V. Self Sterilit

	A	B	C	D
a)	IV	I	V	II
b)	II	I	IV	II
c)	III	I	II	V
d)	II	II	I	IV

206. Arrange the following in the descending order based on their % in total leukocyte count:

(I) Monocytes (II) Neutrophils (III) Basophils
(IV) Lymphocytes (V) Eosinophils

(a) I-II-III-IV-V
(b) II-IV-I-V-III
(c) II-IV-III-V-I
(d) II-IV-I-III-V

207. Match the generic name listed under column-I with the common name given under column-II. Choose the answer which gives the correct combination of the alphabets of the two columns:

Column-I (Genus)	Column-II (Common name)
A. Millepora	p. Sea wasp
B. Pennatula	q. Blue coral
C. Heliopora	r. Sea pen
D. Chiropsalmus	s. Stinging coral

(a) A = s, B = q, C = r, D = p
(b) A = q, B = r, C = s, D = p
(c) A = s, B = r, C = q, D = p
(d) A = r, B = q, C = s, D = p

208. The route through which the developmental stages of Ascaris serially pass in man includes

(a) Outside → intestine → liver → heart → lung → intestine → out side
(b) Outside → trachea → lung → heart → liver → intestine → outside
(c) Outside → oesophagus → stomach → heart → lung → heart → trachea → outside
(d) Outside → stomach → oesophagus → heart → lung → trachea → outside

209. Match the following

Scientific name	Character
A) Scyllium	I) Operculum
B) Labeo	II) Sensory tentacle
C) Ichthyophis	III) Pelvic claspers
D) Petromyzon	IV) Suctorial mouth

	A	B	C	D
(a)	II	III	V	IV
(b)	V	IV	II	III
(c)	III	I	II	IV
(d)	III	IV	II	I

210. In the above diagram of a typical chordate identify A & B

(a) A= notochord B= nerve chord C= heart
(b) A= nerve cord B= notochord C= pharynx
(c) A= nerve cord B= notochord C= gut
(d) A= notochord B= intestine C= nerve cord

211. A lake near a village suffered heavy mortality of fishes within a few days. Considerthe following reasons for this

(a) Lots of urea and phosphate fertilizerwere used in the crops in the vicinity
(b) The area was sprayed with DDT by an aircraft
(c) The lake water turned green and stinky
(d) Phytoplankton populations in the lake declined initially thereby greatly reducing photosynthesis

Which two of the above were the main causes of fish mortality in the lake?

(a) a, b   (b) b, c   (c) c, d   (d) a, c

212. The blood supply to the eyes In frog is through

(a) Lingual artery   (b) Internal carotid artery
(c) Palatine artery (d) Occipito - vertebral artery

213. "A brief reduction In size of a population due to natural calamities usually leads to random genetic drift". For this statement, identify the correct example from the following :

(a) Human population of Pitcairn. Island
(b) Polydactylic dwarfs in Amish population
(c) Long necked giraffe
(d) Industrial melanism

214. Match the following

	List - I		List - II
A)	Glans penis	I)	Common duct from seminal vesicle and vas deferens
B)	Ejaculatory duct	II)	Enlarged end
C)	Sertoli cells	III)	Connets rete testes with epididymis
D)	Vasefferentia	IV)	Provide nourishment to sperms

(a) A-I, B-II, C-III, D-IV   (b) A-II, B-I, C-IV, D-III
(c) A-II, B-III, C-I, D-IV   (d) A-III, B-II, C-I, D-IV

215. Match the following and choose the correct answer

	List-I		List-II
A.	Ratchet mechanism	I.	Accumulation of lactic acid
B.	Phosphagen	II.	Re synthesis & transport back of glycogen to muscle
C.	Muscle fatigue	III.	Immediate additional source of energy
D.	Cori cycle	IV.	Basis for sliding filament hypothesis

(a) A-II, B-I, C-III, D-IV   (b) A-II, B-I, C-IV, D-III
(c) A-IV, B-III, C-I, D-II   (d) A-II, B-IV, C-I, D-III

216. Assertion (A): The first Rh+ve child born to the mother of Rh-ve blood group and father of Rh+ve blood group is safe (not affected by HDNB).
Reason (R): Mother starts preparing antibodies against Rh antigen in her blood just at the time of parturition of the first baby

(a) Both A and R are true and 'R' is correct explanation of A
(b) Both A and R are true and 'R' is not correct explanation of A
(c) A is false, R is true
(d) A is true, R is false

217. Study the following picture related to ECG and find out the abnormality that you have noticed

(a) Myocardial ischemia
(b) Myocardial infraction
(c) Rheumatic fever
(d) Myocardial damage

218. Find out the correct links of the given parts in cockroach

A) Hepatic caeca	I)	6
B) Malpighian tubules	II)	6-8
C) Rectal papillae	III)	6 longitudinal
D) Plates	IV)	6 bundles
E) Secretary & absorptive cells		
F) Excretion		
G) Re absorption of water Primary folds		
H) Grinding mill		

	A	B	C	D
a.	II-E	VI-F	I-G	III-H
b.	I-G	VI-F	II-E	III-H
c.	IV-F	II-E	III-H	I-G
d.	III-H	I-G	IV-F	II-E

219. Match the following

	Set-I		Set-II
I)	Trophocytes	A)	Storing of uric acid
II)	Mycetocytes	B)	Lipid secretion
III)	Oenocyte	C)	Storage of food
IV)	Urate cells	D)	Containing of symbiotic bacteria

(a) I-D, II-A,-III-B, IV-C   (b) I-A, II-C, III-D, IV-B
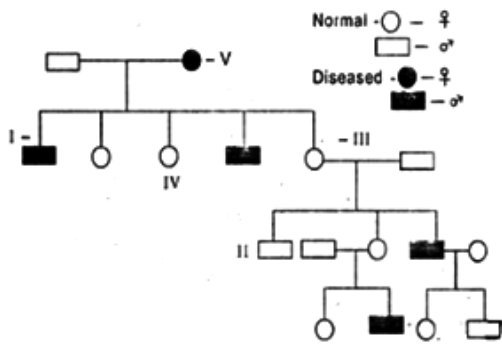(c) I-C, II-D, III-B, IV-A   (d) I-B, II-C, III-A, IV-D

220. Match the following

	List - I		List - II
A.	Anti tetanus serum	1.	Cell mediated immunity
B.	Vaccination	2.	Humoral immunity
C.	Graft rejection	3.	Artificially acquired active immunity
D.	Protects against extra cellular bacteria	4.	Naturally acquired active immunity
		5.	Artificially acquired passive immunity

(a) A - 3; B - 5; C - 1; D - 2
(b) A - 5; B - 3; C - 1; D - 2
(c) A - 5; B - 3; C - 2; D - 1
(d) A - 5; B - 4; C - 1; D - 2

221. Statement (S): Conjugation is a temporary union between two ciliates belonging to two different mating types for the exchange and reconstitution of nuclear materials
Reason (R): Conjugation occurs between two inactive individuals which have gained their vigour and vitality due to chromosomal imbalance in their macronuclei caused by repeated amitotic division. The correct answer is :

(a) Both S and R are true and R explains S
(b) Both S and S are true but R cannot explain R
(c) Only R is correct but not R
(d) Both S and R are wrong

Normal - ○ - ♀
      □ - ♂
Diseased - ● - ♀
      ■ - ♂

222.

In the above given pedigree, assume that no outsider marrying in, carry a disease. Write the genotypes of II and III.

(a) All $X^d y$

(b) $X^d X X^d y$ and $X^d y^D$

(c) $X^D Y$ and $X^D X^d$

(d) $X^d X^d$ and $X^d y$

223. Identify the 'Cat Fish' from the below given fishes

  a. CatlaCatla
  b. Cryprinuscarpio
  c. Cirrhinamrigala
  d. Wallagoattu

224. Arrange the periods of palaeozoic era in ascending order in· a geological time scale:

  a. Cambrian → Ordovician → Silurian → Devonian → Carboniferous → Permian

  b. Cambrian → Devonian → Ordovician → Silurian → Carboniferous → Permian

  c. Cambrian → Ordovician → Devonian → Silurian → Carboniferous → Permian

  d. Silurian → Devonian → Cambrian → Ordovician → Permian → Carboniferous

225. Match the following concepts:

Set-I	Set-II
a. Allen's rule	1. Fishes of cooler waters have more vertebrae than those found in hot waters
b. Bergman's rule	2. Temperature influences pigmentation in animals
c. Jordan's rule	3. Temperature affects various organs of animals
d. Gloger's rule	4. Body size of homeotherms in cold region is large whereas those living in hot regions are small

The correct match is:

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

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

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

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

226. The animal in which that space between the gut and the body wall is filled with meseneliyme is

(a) Echinodiscus   (b) Enterobius

(c) Eunice   (d) Echinococcus

227. Assertion (A) :"The Biological Species" concept helps us to ask how species are formed.

Reason (R) :Theconcept of Biological species focuses our attention on the question of how reproductive isolation comes about.

The correct answer is :

a. Both A & R are correct, but R does not explain A

b. Both A & R are not true

c. Only A is true but R is not correct

d. Both A & R are correct and R is true explanation to A

228. In coelenterates the mouth in medusa is located in

(a) Hypostome   (b) Manubrium

(c) Velum   (d) Basal disc

229. Sterility is caused by this pollutant in water

(a) Cadmium   (b) Mercury

(c) Copper   (d) Manganese

230. In poultry the disease Coryza is caused by

(a) Bacteria   (b) Protozoan

(c) Virus   (d) Fungi

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Space for rough work

Space for rough work

ANSWER KEYS

SECTION – I : ENGLISH

ANSWERS:

1.	B	16.	A
2.	C	17.	B
3.	B	18.	A
4.	A	19.	D
5.	C	20.	A
6.	A	21.	B
7.	C	22.	C
8.	B	23.	D
9.	A	24.	A
10.	D	25.	B
11.	D	26.	D
12.	A	27.	B
13.	A	28.	C
14.	C	29.	A
15.	A	30.	C

SECTION – II : PHYSICS

ANSWERS:

31	D	41	A	51	C	61	D	71	D
32	A	42	A	52	A	62	B	72	A
33	C	43	A	53	D	63	C	73	A
34	C	44	B	54	A	64	C	74	B
35	C	45	D	55	C	65	A	75	B
36	B	46	C	56	A	66	C	76	B
37	D	47	A	57	B	67	D	77	C
38	A	48	D	58	D	68	D	78	B
39	D	49	A	59	D	69	D	79	A
40	A	50	C	60	B	70	A	80	C

SECTION – III : CHEMISTRY

ANSWERS:

81.	B	86.	A
82.	A	87.	A
83.	A	88.	C
84.	D	89.	B
85.	B	90.	C

91.	A		108.	A
92.	B		109.	A
93.	C		110.	C
94.	B		111.	D
95.	B		112.	C
96.	A		113.	A
97.	D		114.	C
98.	A		115.	D
99.	D		116.	D
100.	D		117.	A
101.	B		118.	A
102.	D		119.	C
103.	C		120.	B
104.	A		121.	D
105.	D		122.	B
106.	C		123.	D
107.	B		124.	C
125.	C		128.	D
126.	C		129.	C
127.	B		130.	D

SECTION – IV : MATHEMATICS

ANSWERS:

131. B		152. C
132. D		153. C
133. C		154. C
134. A		155. A
135. B		156. D
136. A		157. B
137. B		158. C
138. A		159. B
139. C		160. A
140. C		161. B
141. B		162. B
142. B		163. A
143. C		164. D
144. B		165. B
145. A		166. A
146. C		167. D
147. D		168. B
148. C		169. B
149. C		170. A
150. B		171. C
151. A		172. C

173. B
174. A
175. B
176. C

177. A
178. A
179. A
180. B

SECTION – V: BIOLOGY

ANSWERS:

181.	C		207.	C
182.	B		208.	A
183.	D		209.	C
184.	C		210.	A
185.	B		211.	D
186.	B		212.	D
187.	A		213.	B
188.	C		214.	B
189.	D		215.	C
190.	B		216.	A
191.	A		217.	A
192.	D		218.	A
193.	B		219.	C
194.	C		220.	B
195.	D		221.	C
196.	A		222.	B
197.	C		223.	D
198.	C		224.	A
199.	C		225.	C
200.	A		226.	D
201.	A		227.	D
202.	A		228.	B
203.	B		229.	D
204.	C		230.	A
205.	C			
206.	B			