Nagaland Board of School Education
Kohima

NO.NBE-18/Ad-Misc(12)/2014-15 1937 Dated Kohima, the 1st Sept' 2014

To,

The Heads of Registered Institutions.

Subject: **JEE (Main) and AIPMT / NSPMT Examinations.**

Sir/Madam,

I take this opportunity to appraise the institutions on matters relating to All India Pre Medical Test (AIPMT) and JEE (Main) Examinations which was conducted by Central Board of Secondary Education (CBSE). You may be aware that these entrance examinations have been streamlined recently. Therefore, in order to prepare the students to sit for the above entrance examinations, you are requested to take note of the following for guiding the students:

1. The Council of Boards of School Education in India (COBSE) and NCERT has come out with a Common Core Syllabus in science stream which had been introduced in 2011. This **common core syllabus** is followed by all the Boards and Councils in the country.

   The NBSE has introduced the same w.e.f. academic session 2011.

2. The entrance examination of JEE (Main) is to select students to pursue higher studies in Engineering and its allied courses and AIPMT is for Medical and other subsidiary courses. The subject combination for JEE (Main) is Physics, Chemistry & Mathematics (PCM) and AIPMT is Physics, Chemistry & Biology (PCB).

3. Central Institutes/Universities admit students based on the JEE (Main) and AIPMT scores in order of merit.

4. There are some States who participate in these 2(two) national entrance examinations to allocate the state quotas. Other states who do not join this scheme conduct their own state level examination.

5. The Medical Council of India (MCI) has prescribed a minimum 40% score as criteria for entry into medical courses in Medical/Dental Colleges w.e.f. 2014. This means that a student must secure a minimum of 40% at the AIPMT or *State Pre-Medical Test* for admission into medical courses.

6. The type of questions in these 2(two) entrance examinations are of Multiple Type Questions (MCQ) where *analytical, application, reasoning, conceptual, etc. i.e. Higher Order Thinking Skills (HOTS)* of the students are tested.

7. As the examination is competitive in nature, students aspiring to go for higher studies in technical/medical and allied courses requires thorough preparations. The students must know the concepts and maintain consistency in their studies to compete in the entrance examinations. Students should *avoid rote memory nor depend on crash courses of 2 or 3 months duration* to appear in these examinations.

Cont'd.....2

Students should be sensitized, encouraged and given proper guidance in the line of the above. The heads of institutions are therefore, requested to create awareness among the students. It would be best in the interest of the students if they start preparing right from the secondary level.

The past question papers of CBSE can be downloaded from the CBSE website (***http://www.cbse.nic.in***).

For reference, a copy of Nagaland State Pre Medical Test (NSPMT) 2014 question booklet is enclosed to those institutions with *science stream* only. It can also be downloaded from the NBSE website (***http://www.nbsenagaland.com***).

Yours faithfully,

1.9.2014

(Mrs. Asano Sekhose)
Chairman

NO.NBE-18/Ad-Misc(12)/2014-15 1937 Dated Kohima, the 1st Sept' 2014

Copy for information:

1. The Commissioner & Secretary to the Government of Nagaland, Department of School Education, Nagaland, Kohima.
2. The Commissioner & Secretary to the Government of Nagaland, Higher & Technical Education, Nagaland, Kohima.
3. The Principal Director, School Education, Nagaland, Kohima.
4. The Director, Technical Education, Nagaland, Kohima.
5. The Director, Higher Education, Nagaland, Kohima.

1.9.2014

(Mrs. Asano Sekhose)
Chairman

No. Total no. of printed pages: 19

Nagaland State Pre Medical Test 2014

Roll No. in figures

Roll No. in words _____

Instructions

(5 minutes shall be given for reading the instructions)

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD

1. Use only blue/black pen for writing the particulars and answers.
2. The test is of 3 hours duration and contains 160 questions. The maximum mark is 640.
3. Each question carries 4 marks each. For each correct answer, 4 marks will be given. For each incorrect answer, 1 mark will be deducted. No deduction will be made if no response is given. *Multiple responses will also be subject to negative marking.*
4. Answer to each question is to be indicated by writing the serial letter of the alternative against the corresponding question number. (*only capital letters should be used*). **Answers which are not legible shall not be evaluated**.
5. Separate scoring sheet is provided for writing the answers.
6. Rough work can be done anywhere in the question booklet.
7. Use of white correcting fluid is not permitted. In case of corrections in the answer, it should be struck off clearly and new alternative written.
8. Each candidate must show on demand their admit card to the Invigilator.
9. No candidate shall be allowed to leave their seat without the permission of the Centre Superintendent/Invigilator.
10. The scoring sheet must be handed over to the Invigilator before leaving the examination hall. Candidates are allowed to retain the question booklet.
11. All candidates shall sign in the attendance register.
12. Prohibited materials shall not be brought into the examination hall.
13. The candidates are governed by the rules and regulations of the Board with regard to their conduct in the examination. All cases of unfairmeans shall be dealt with as per provisions of the rules and regulations.

1. The dimensional formula of angular momentum is
   (A) $[M\ L\ T^{-1}]$ (B) $[ML^2T^{-1}]$
   (C) $[M\ L^2\ T^0]$ (D) $[M^0L^2T^{-2}]$

2. If the position- time graph of a particle is parallel to the time-axis, the velocity of the particle is
   (A) zero (B) infinity
   (C) variable (D) more than 2m/s

3. A particle is acted upon by a force of constant magnitude which is always perpendicular to the velocity of the particle. The motion of the particle takes place in a plane. It follows that
   (A) its velocity is constant (B) its acceleration is constant
   (C) its kinetic energy is constant (D) it moves in a straight line

4. A light body and a heavy body have the same linear momentum. Which of the following statement is correct ?
   (A) they have same kinetic energy
   (B) kinetic energy of light body is more
   (C) kinetic energy of heavy body is more
   (D) they have the same velocity

5. Which of the following cylindrical rods will conduct the most heat, when their ends are maintained at the same steady temperature ?
   (A) length 100cm, radius 1cm (B) length 100cm, radius 2cm
   (C) length 200cm, radius 2cm (D) length 200cm, radius 1cm

6. When there is no heat exchange between surrounding and a system, then the process is related with
   (A) isobaric (B) isochoric
   (C) isothermal (D) adiabatic

7. The number of degrees of freedom for a mono atomic gas is
   (A) 1 (B) 2
   (C) 3 (D) 4

8. The time period of a body executing simple harmonic motion is
   (A) directly proportional to acceleration
   (B) directly proportional to square root of acceleration
   (C) inversely proportional to square root of acceleration
   (D) inversely proportional to square of acceleration

9. The number of electrons in one coulomb of charge is
   (A) 1.6×10^{-19} (B) 6.25×10^{18}
   (C) 9.1×10^{-31} (D) 6.25×10^{23}

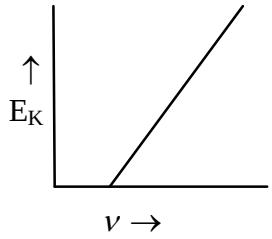
10. A carbon resistor is marked in sequence with bands of red, black, orange and gold. The resistance and tolerance of the carbon resistor is
    (A) $10 \times 10^3 \pm 10\,\%$ (B) $20 \times 10^3 \pm 5\,\%$
    (C) $30 \times 10^2 \pm 10\,\%$ (D) $26 \times 10^2 \pm 5\,\%$

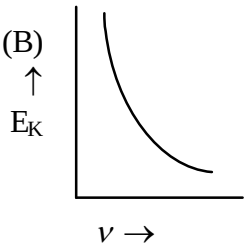
11. The torque experienced by a current loop in a uniform magnetic field is maximum when
    (A) the magnetic field is perpendicular to the plane of the loop
    (B) the magnetic field makes an angle 60^0 with the plane of the loop
    (C) the magnetic field makes an angle 30^0 with the plane of the loop
    (D) the magnetic field is parallel to the plane of the loop

12. If the electric field in an electromagnetic wave has a maximum strength of 600 NC^{-1}, the maximum strength of the accompanying magnetic field is
    (A) 0.5×10^6 T (B) 18×10^{10}T
    (C) 18×10^{-6} T (D) 2×10^{-6} T

13. Bending of light about the corner of a sharp edged obstacle is called
    (A) deviation (B) dispersion
    (C) polarisation (D) diffraction

14. The kinetic energy (E_K) of a photo electron varies with the frequency (υ) of the incident radiation as which of the following graphs

(A)


(B)


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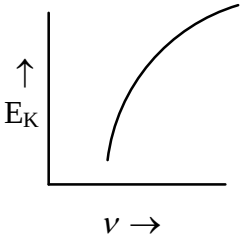
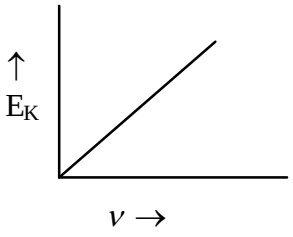


(D)


15. The reactance of a capacitor of capacitance C is X. If both the frequency and capacitance be doubled, then new reactance will be
    (A) X (B) 2X
    (C) 4X (D) X/4

16. A force is inclined at 60^0 to the horizontal. If its rectangular component in the horizontal direction is 50N, find the magnitude of force

(A) $\frac{100}{\sqrt{3}}$ N (B) 100 N

(C) 25 N (D) $25\sqrt{3}$ N

17. A horizontal force of 10.41N is applied to a 1.5kg block, which rests on a horizontal surface. If the coefficient of friction is 0.3, then acceleration produced in the block is

(A) 2 m/s^2 (B) 3 m/s^2

(C) 4 m/s^2 (D) 5 m/s^2

18. Moment of inertia of a circular wire of mass M and radius R about its diameter is

(A) $\frac{1}{2}MR^2$ (B) $\frac{1}{4}MR^2$

(C) $2MR^2$ (D) MR^2

19. If the mass of Mars is $\frac{1}{9}$ times the mass of Earth and its radius is $\frac{1}{2}$ times the radius of Earth, then the ratio of acceleration due to gravity of Mars to that of Earth is

(A) $\frac{4}{9}$ (B) $\frac{9}{4}$

(C) $\frac{2}{9}$ (D) $\frac{9}{2}$

20. Two wires of same length and material but of different radius are suspended from a rigid support. Both carry the same load. Which of the following statements are correct

(1) stress in the two wires are same

(2) stress in the two wires are different

(3) extension in the two wires are same

(4) strain in the two wires are different

(A) 1 only (B) 1 and 3

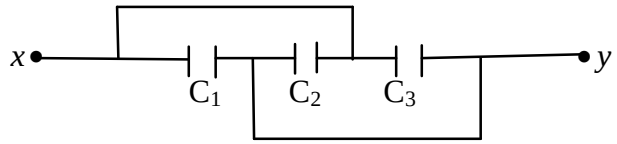
(C) 2 and 3 (D) 2 and 4

21. Sound wave is a

(A) transverse wave (B) longitudinal wave

(C) propagate wave (D) none of these

22. Three capacitors C_1 , C_2 and C_3 are connected as shown. The equivalent capacitance of the combination between points *x* and *y* is



(A) $\frac{C_1\ C_2\ C_3}{C_1 + C_2 + C_3}$ (B) $\frac{C_1\ C_2\ C_3}{C_{23} + C_{13} + C_{12}}$

(C) $C_1 + C_2 + C_3$ (D) $\frac{C_1\ C_2}{C_1 + C_2} + C_3$

23. A wire is stretched such that its diameter becomes half its original diameter. The new resistance will
(A) remain unchanged
(B) be 8 times the original resistance
(C) be 16 times the original resistance
(D) be $\frac{1}{2}$ times the original resistance

24. Two parallel resistors of 5 ohms and 20 ohms are connected in left arm of a metre bridge. If the null point is at 40cm from the left end of the wire, the value of resistance connected in right arm is
(A) 2.6 Ω (B) 6Ω
(C) 600Ω (D) 4Ω

25. A solenoid having 1000 turns in its windings uniformly distributed over a length of 0.5m produces a magnetic field of 2.5×10^{-3}T at the centre of the solenoid. The current in the solenoid is
(A) 0.5A (B) 1A
(C) 1.5A (D) 2A

26. When the current changes from +2A to -2A in 0.05s, an emf of 8V is induced in the coil. The coefficient of self induction of the coil is
(A) 0.1H (B) 0.2H
(C) 0.4H (D) 0.8H

27. Double convex lenses are to be manufactured from a glass of refractive index 1.55 with both faces of same radius of curvature. If focal length is 20cm, then the required radius of curvature is
(A) 0 (B) 11cm
(C) 22cm (D) 33cm

28. In a Young's double slit experiment, the fringes are formed at a distance of 1m from double slit of separation 0.12mm. If wavelength of light used is $6000\,\mathring{A}$, then the distance of the 3rd dark band from the centre of the screen is

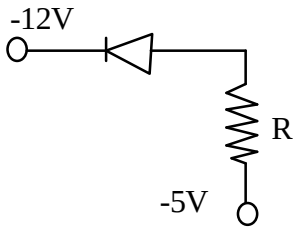
(A) 1.5cm (B) 1.75cm
(C) 1.25cm (D) 2.00cm

29. The shortest wavelength in the bracket series of hydrogen spectrum is

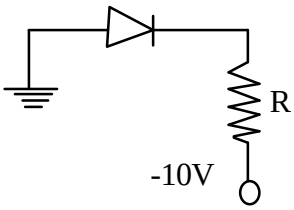
(A) $14585\,\mathring{A}$ (B) $36463\,\mathring{A}$
(C) $82041\,\mathring{A}$ (D) $27347\,\mathring{A}$

30. In which of the following figures, the junction diode is reverse biased ?

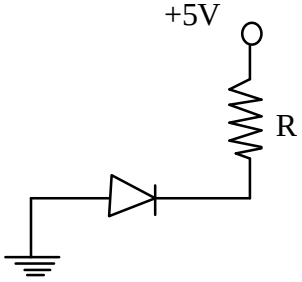
(A)



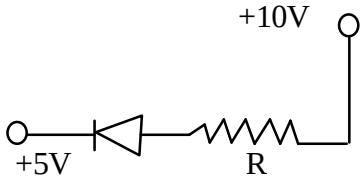
(B)



(C)



(D)



31. A ball is thrown from a point with a speed υ at an angle of projection θ. From the same point and the same instant, a person starts running with a constant speed $\upsilon/2$ to catch the ball. If the person catches the ball, then the angle of projection should be

(A) 30^0 (B) 45^0
(C) 60^0 (D) 90^0

32. Two particles of masses 100gm and 300gm have positions $(2\hat{i}+5\hat{j}+13\hat{k})$ cm and $(-6\hat{i}+4\hat{j}-2\hat{k})$ cm respectively at a given time. The position of the centre of mass is

(A) $-4\hat{i}+\frac{17}{4}\hat{j}+\frac{7}{4}\hat{k}$ (B) $5\hat{i}+\frac{17}{4}\hat{j}-\frac{19}{4}\hat{k}$
(C) $-5\hat{i}-\frac{17}{4}\hat{j}+\frac{19}{4}\hat{k}$ (D) $4\hat{i}-\frac{17}{4}\hat{j}-\frac{7}{4}\hat{k}$

33. The mean radius of earth is R, its angular speed about its own axis is ω and the acceleration due to gravity at the earth's surface is g. The cube of radius of orbit of a geostationary satellite will be

(A) $\frac{R^2 g}{\omega^2}$ (B) $\frac{R^2\omega^2}{g}$

(C) $\frac{Rg}{\omega^2}$ (D) $\frac{R^2 g}{\omega}$

34. Each of the two wings of an aeroplane has an area of $30 m^2$. The speed of air is 70m/s below the wings and 90m/s above the wings. If the plane is in level flight at constant speed, the uplift mass of the plane is (given density of air = $1.29 kgm^{-3}$)

(A) 123840 kg (B) 12636.7 kg

(C) 121363.2 kg (D) 12384 kg

35. The displacement of an object attached to a spring and executing SHM is given by $x = 2\times 10^{-2} \cos \pi t$(in m)

The time at which the maximum speed first occurs is

(A) 0.5s (B) 0.75s

(C) 0.125s (D) 0.25s

36. An infinite plane sheet having charge density 10^{-8} C/m^2 is held in air. The potential difference between two equipotential surfaces of the plane sheet is 5V. The distance between the two equipotential surface is

(A) 8.85 mm (B) 5×10^{-8} m

(C) 88.5 mm (D) 0.2×10^{-8} m

37. A beam of protons with velocity 5×10^5m/s enters a uniform magnetic field of 0.5T at an angle of 30^0 to the field direction. The pitch of the helix described by the proton beam is : (given mass of proton = 1.67×10^{-27} kg)

(A) 2.8×10^{-2} m (B) 5.6×10^{-2} m

(C) 8.4×10^{-2} m (D) 11.2×10^{-2} m

38. In an ac circuit containing only capacitor, the current

(A) leads voltage by 180^0 (B) remains in phase with voltage

(C) leads voltage by 90^0 (D) lags voltage by 90^0

39. In a given reaction

$${}_Z X^A \rightarrow {}_{Z+1} Y^A \rightarrow {}_{Z-1} K^{A-4} \rightarrow {}_{Z-1} K^{A-4}$$

the radioactive radiation are emitted in the sequence of

(A) α, β, γ (B) γ, α, β

(C) β, α, γ (D) γ, β, α

40. The current gain β of a transistor is 50. The input resistance of the transistor, when used in common emitter configuration is $1k\Omega$. The peak value of the collector ac current for an ac peak input voltage of 0.01V is

(A) 100μA (B) 250μA

(C) 500μA (D) 800μA

41. Which of the following pair of compound illustrates the law of multiple proportions ?
(A) Ordinary water and heavy water
(B) Sodium hydroxide and potassium hydroxide
(C) Sodium chloride and sodium bromide
(D) Carbon monoxide and carbon dioxide

42. Two electrons occupying the same orbital are distinguished by
(A) principal quantum number (B) azimuthal quantum number
(C) spin quantum number (D) magnetic quantum number

43. The correct order of first ionization potential among the following elements – Be, B, C, N and O is
(A) B < Be < C < O < N (B) B < BE < C < N < O
(C) Be < B < C < N < O (D) Be < B < C < O < N

44. Two lone pairs of electrons and two bond pairs of electrons are present in
(A) NH_3 (B) H_2O
(C) CO_2 (D) BF_3

45. Which of the following exhibits the weakest intermolecular forces ?
(A) NH_3 (B) HCl
(C) He (D) H_2O

46. For the equilibrium, $H_2O(l) \rightleftharpoons H_2O(g)$ at 1atm and 298K, the
(A) standard free energy change is equal to zero ($\Delta G^0 = O$)
(B) free energy change as less than zero ($\Delta G < O$)
(C) standard free energy change is less than zero ($\Delta G^0 < O$)
(D) standard free energy change is greater than zero ($\Delta G^0 > O$)

47. For the reaction, $N_2(g) + O_2(g)$ $2NO(g)$, the production of NO will be favoured by
(A) high pressure (B) low pressure
(C) presence of catalyst (D) high concentration of N_2

48. A solution with P^H=2 is more acidic than one with a P^H=6 by a factor of
(A) 10000 (B) 8000
(C) 4000 (D) 2

49. The number of moles of $KMnO_4$ reduced by one mole of KI in alkaline medium is
(A) one (B) two
(C) five (D) eight

50. Action of water or dilute mineral acids on metals can
(A) monohydrogen (B) tritium
(C) dihydrogen (D) trihydrogen

51. The ionization enthalpy of alkaline earth metals is
    (A) greater than element of 1 and 13 groups
    (B) greater than alkali metals but less than elements of group 13
    (C) less than alkali metals
    (D) equal to alkali metals

52. Choose the correct statement with respect to carbon monoxide
    (A) It combines with water to form carbonic acid
    (B) It reacts with haemoglobin in red blood cells
    (C) It is a powerful oxidizing agent
    (D) It is used to prepare aerated drinks

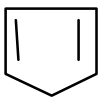
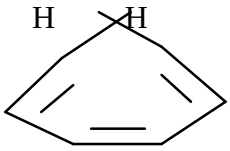
53. The Lassaigne's extract is boiled with dilute HNO3 before testing for halogens because
    (A) silver halide are soluble in HNO_3
    (B) Ag_2S is soluble in HNO_3
    (C) $Ag\ CN$ is soluble in HNO_3
    (D) Na_2S and $NaCN$ if present are decomposed by HNO_3

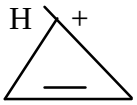
54. The ortho-para directing group among the following is
    (A) $-COCH_3$ (B) $-NHCOCH_3$
    (C) $-COOH$ (D) $-CN$

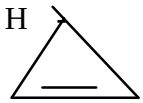
55. The bone disease "Fluorosis" is caused by the presence of
    (A) carbon monoxide in air (B) sulphur dioxide in air
    (C) fluoride in water (D) pesticides in water

56. The position of double bond in an alkene molecule can be located by the process of
    (A) bromine water test (B) ozonolysis
    (C) pyrolysis (D) halogenation

57. Which of the following satisfy Huckel rule of aromaticity ?

    (A) 
    (B) 

    (C) 

    (D) 

58. Bio chemical oxygen demand measures
    (A) industrial pollution (B) oxygen required by fish
    (C) oxygen required by microbes (D) dissolved oxygen in water

59. In a face centred cubic lattice, a unit cell is shared equally by how many unit cell ?
(A) 2 (B) 4
(C) 6 (D) 8

60. 1% aqueous solution (mass-volume) of certain substance is isotonic with 3% solution of glucose (molar mass 180). The molar mass of substance is
(A) 60 (B) 120
(C) 180 (D) 540

61. The conductivity of N/10 *KCl* solution at 20^0c is 0.0212 $ohm^{-1}cm^{-1}$ and the resistance of the cell containing this solution at 20^0c is 55 ohm. The cell constant is
(A) 4.616 cm^{-1} (B) 3.324 cm^{-1}
(C) 2.173 cm^{-1} (D) 1.166 cm^{-1}

62. For a certain reaction, $aA \rightarrow bB$, the rate of reaction is doubled when the concentration of A is increased by four times. The rate of reaction is equal to
(A) $k[A]^{1/2}$ (B) $k[A]^{1/a}$
(C) $k[A]^a$ (D) $k[A]$

63. When a colloidal solution is observed under ultramicroscope, we can see
(A) size of the colloidal particle
(B) shape of the colloidal particle
(C) relative size of the colloidal particle
(D) light scattered by colloidal particle

64. In the froth-floatation process for benefication of the ores, the ore particles float because
(A) they are light
(B) their surface is not easily wetted by water
(C) they bear electrostatic change
(D) they are insoluble

65. Ozone can be tested by
(A) *Zn* (B) *Au*
(C) *Ag* (D) *Hg*

66. Carbon can form large number of compounds because it has
(A) low electron affinity (B) no d-orbitals in valence shell
(C) property of ratenation (D) variable valency

67. The high oxidizing power of fluorine is due to
(A) high electron affinity
(B) high heat of dissociation and low heat of hydration
(C) high heat of hydration and low heat of dissociation
(D) high heat of hydration and high heat of dissociation

68. Helium-oxygen mixture is used by deep sea divers in preference to nitrogen-oxygen mixture because
(A) helium is much less soluble in blood than nitrogen
(B) nitrogen is much less soluble in blood than helium
(C) due to high pressure deep under the sea, nitrogen and oxygen react to give poisonous nitric oxide
(D) nitrogen is highly soluble in water

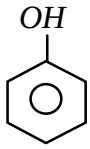
69. Which of the following would be diamagnetic ?
(A) Cu^{2+} (B) Ni^{2+}
(C) Cd^{2t} (D) Ti^{3+}

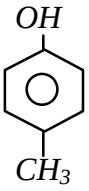
70. Which of the following statement is not correct ?
(A) $La(OH)_3$ is less basic than $Lu(OH)_3$
(B) La is actually an element of transition series rather than Lanthanides
(C) Atomic radii of *Zr* and *Hf* are same because of Lanthamides contraction
(D) In Lanthanide series, the ionic radius of Lu^{3t} is smallest

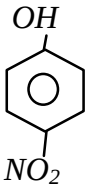
71. When EDTA combines with cations, it form
(A) chelates (B) clathrates
(C) non-stoichiometric compounds (D) double salts

72. An alkyl halide by formation of Grignard's reagent followed by hydrolysis yields butane. What is the original alkyl halide ?
(A) Ethyl halide (B) Propyl halide
(C) Butyl halide (D) Methyl halide

73. The correct acidic order of the following in

I. 

II. 

III. 

(A) I > II >III (B) III > I > II
(C) II > III > I (D) I > III > II

74. Which one of the following products is obtained when acetaldehydes react with a dil. alkali ?
(A) $CH_3CH_2CH_2OH$ (B) $CH_3CHOHCH_2CHO$
(C) CH_3COCH_3 (D) *CH3COOH*

75. An alkene C_7H_{14} on reductive ozonolysis gives an aldehyde with formula C_3H_6O and a ketone. The ketone would be
(A) Z - butanone (B) 2 - pentanone
(C) 3 – pentanone (D) propanone

76. The carboxylic acid that does not undergo HVZ reaction is
(A) CH_3COOH (B) $(CH_3)_2\ CHCOOH$
(C) $CH_3CH_2CH_2CH_2COOH$ (D) $(CH_3)_3\ C\ COOH$

77. Which of the following amines react with chloroform and alkali to give an isocyanide ?
(A) $(C_2H_5)_3N$ (B) $(C_2H_5)_2\ NH$
(C) $C_2H_5NH_2$ (D) $(C_2H_3)_2\ NH$

78. Which of the following types of polymers has the strongest inter particle forces ?
(A) Elastomers (B) Thermoplastics
(C) Fibres (D) Thermosettings polymers

79. The letter D is carbohydrates signifies
(A) dextro rotator (B) mode of synthesis
(C) configuration (D) diamagnetic nature

80. Antipyretics are medicinal compounds which
(A) lowers the body temperature (B) relieves pain
(C) control malaria (D) can kill other organisms

81. Which of the following is true of viruses ?
(A) They invariably contain DNA
(B) Their genetic material is RNA and not DNA
(C) They multiply only on host cell
(D) They occur only inside bacteria

82. Which of the following is general in characters as compared to genus ?
(A) Family (B) Class
(C) Division (D) Species

83. Which one of the following is not a characteristic feature of all chordates ?
(A) Dorsal tubular nerve cord
(B) A diaphragm separating thorax from abdomen
(C) Pharyngeal gill clefts in the early embryonic stages
(D) Presence of coelem

84. The study of fruits is called
(A) Pomology (B) Anthology
(C) Mycology (D) Ornithology

85. Smooth endoplasmic reticulum synthesises
(A) Steroids and lipids (B) Proteins
(C) Carbohydrates (D) Nucleic acid

86. The most appropriate distinction of prokaryotic cell from eukaryotic cell is
(A) Lack of DNA and nucleus
(B) Lack of nuclear envelope around DNA and absence of membrane bound organelles
(C) Lack of ribosomes
(D) Fundamentally different biochemistry

87. Golgi apparatus is absent in
(A) liver cells (B) yeast
(C) higher plants (D) blue green algae

88. RNA differs from DNA in the replacement of thymine with
(A) Uracil (B) Adenine
(C) Guanine (D) Cytosine

89. What is the proper sequence in mitosis ?
(A) Telophase, anaphase, metaphase and prophase
(B) Anaphase, metaphase, telophase and prophase
(C) Prophas,e metaphase, anaphase and telophase
(D) Metaphase, telophase, prophase and anaphase

90. When does synapsis occurs in meiosis ?
(A) Leptotene (B) Diplotene
(C) Zygotene (D) Pachytene

91. When beetroot cylinder are washed and then placed in cold water, none of the anthocyanins come out. This indicates most likely that plasma membrane is
(A) Permeable to anthocyanins
(B) Impermeable to anthocyanins
(C) Differentially permeable to anthocyanins
(D) Dead

92. Stomata will open, if there is accumulation of the following element in the guard cells
(A) Magnesium (B) Iron
(C) Zinc (D) Potassium

93. The first step in photosynthesis is
(A) Joining of 3 carbon atoms to form glucose
(B) Formation of ATP
(C) Ionization of water
(D) Excitement of an electron of chlorophyll a by a photon of light

94. Which of the following statements regarding ‘compensation point’ is incorrect ?
(A) No growth occurs
(B) The rate of photosynthesis exactly balances that of respiration
(C) Neither oxygen nor carbondioxide is given off from the leaves
(D) It occurs when the light intensity falls to about 20 percent of that found on bright sunny day

95. During prolonged fasting, in what sequence are the following organic compounds used up by the body ?
(A) First fats next carbohydrates and lastly proteins
(B) First carbohydrates next fats and lastly proteins
(C) First carbohydrates next proteins and lastly fats
(D) First proteins next lipids and lastly carbohydrates

96. At high altitude, RBCs of human blood will
(A) Decrease in size (B) Decrease in number
(C) Increase in number (D) Increase in size

97. A person passes much urine and drinks much water but his blood glucose level is normal. This may be due to
(A) Fall in glucose concentration in urine
(B) Reduction of insulin secretion from pancrease
(C) Reduction of vasopressin release from posterior pituitary
(D) Increase in secretion of glucose

98. Proximal and distal convoluted tubules are the parts of a
(A) Nephron (B) Oviduct
(C) Vas deferens (D) Caecum

99. If the parathyroid glands of man are removed, the specific result will be
(A) Onset of aging (B) Disturbance of calcium level in blood
(C) Onset of myxoedema (D) Elevation of blood pressure

100. Insulen is secreted by
(A) Alpha cells of pancreas (B) Kupffer cells of liver
(C) Chromaffins cells of adrenal (D) Beta cells of pancreas

101. Double fertilization is found in
(A) Angiosperms (B) Gymnosperms
(C) Pteridophytes (D) Bryophytes

102. In banana, the edible part is
(A) Fleshy epicarp (B) Penicarp
(C) Rudimentary endocarp and fleshy mesocarp
(D) Rudimentary mesocarp and fleshy endocarp

103. Estrogen is secreted by
(A) Anterior pituitary (B) primary follicle
(C) Graafian follicle (D) Corpus luteun

104. During cleavage, what is true about cells
(A) The division is like meiosis
(B) Size do
(C) Nucleo cytopasmic ratio remains unchanged
(D) There is less consumption of oxygennot increase

105. Blastopore is
(A) Future anterior end of embryo (B) Found is blastula
(C) Opening of neural tube (D) Opening of gastrocoel

106. Genotype means
(A) Genetic composition of germ cell
(B) Genetic composition of an organ
(C) Genetic composition of individual
(D) Genetic composition of plastids

107. Miller synthesized amino acids from
(A) NH_3, CH_4, CN and O_2 (B) NH_3, CH_4, H_2 and H_2O
(C) H_2, O_2, N_2 and H_2O (D) CH_4, H_2, CN and O_2

108. Lamarck's theory of organic evolution is properly stated as
(A) Inheritance of mutant characters
(B) Inheritance of vestigial characters
(C) Inheritance of ancestral characters
(D) Inheritance of acquired characters

109. The interforns make the cells resistant to
(A) viral infection (B) bacterial infection
(C) microbial infection (D) protozoan infection

110. When the body starts rejecting its own cells, it is called
(A) Immuno deficiency (B) Immuno suppression
(C) Autoimmunity (D) Autografting

111. Which one of the following is used to join segments of DNA during genetic Engineering ?
(A) Lipase (B) Ligase
(C) Gyrase (D) Helicase

112. Which one of the following animals can live from birth to death without even drinking water ?
(A) Kangoroo (B) Camel
(C) Kangaroo rat (D) Desert cat

113. If we completely remove the decomposers from an ecosystem, its functioning will be adversely affected because
(A) the rate of decomposition will be high
(B) energy flow will be blocked
(C) herbivores will not receive solar energy
(D) mineral movement will be blocked

114. If the sequence of bases on DNA is ATG, what will be the bases in the anti codon of tRNA in protein synthesis ?
(A) AUG (B) UAC
(C) TAC (D) ATG

115. The scientific name of Baker's yeast is
(A) *Saccharomyces* (B) *Streptococcus*
(C) *Staphylococcus* (D) *Lactobacillus*

116. The enzyme carbonic antydrase will catalise the following
(A) $NH_2 - CO - NH_2 \rightarrow NH_3 + CO_2$
(B) $H_2O_2 \rightarrow H_2O + O_2$
(C) $CO_2 + H_2O \rightarrow H_2CO_3$
(D) $6CO_2 + 12H_2O \rightarrow 2C_6H_{12}O_6 + 6O_2$

117. Which of the following is found in both annelid and arthropoda ?
(A) Forward flow of blood in vertical vessel, backward flow in dorsal vessel
(B) Double vertical nerve cord
(C) Hollow dorsal nerve cord
(D) Haemocoel as the main body cavity

118. Which is the correct sequence ?
(A) Organism $\rightarrow$ Ecosystem $\rightarrow$ Community $\rightarrow$ Population $\rightarrow$ Landscape
(B) Organism $\rightarrow$ Population $\rightarrow$ Community $\rightarrow$ Ecosystem $\rightarrow$ Landscape
(C) Organism $\rightarrow$ Community $\rightarrow$ Population $\rightarrow$ Ecosystem $\rightarrow$ Landscape
(D) Organism $\rightarrow$ Landscape $\rightarrow$ Community $\rightarrow$ Ecosystem $\rightarrow$ Population

119. Among the following, which plant is completely devoid of roots
(A) *Azolla* (B) *Hydrilla*
(C) *Vallisneria* (D) *Ceratophyllum*

120. The long slenden tube like structures found in phoem tissues are called
(A) Tracheids (B) vessels
(C) sieve tube elements (D) companion cells

121. The vascular bundles in Dicot stem are
(A) collateral (B) endarch
(C) conjoint (D) all of these

122. The string inextensible attachment of skeletal muscle to a bone occurs through
(A) Tendon (B) Ligament
(C) Cartilage (D) Adipose tissue

123. Which one of the following terms is not applicable to coagulation of blood ?
(A) Calcium (B) Bilirubin
(C) Fibrin (D) Fibrinogen

124. Heart sounds normally heard by a physician while holding a stethoscope on to the left side of the chest of patient are due to
(A) contraction of atria (B) contraction of ventricle
(C) closing of AV valves (D) relaxation of semi lunar valves

125. In case of dengue fever, the number of platelets
(A) increases (B) remains constant
(C) decreases (D) first increases and then decreases

126. The neurons found in the brain and spinal cord are
(A) Unipolar (B) Bipolar
(C) Tripolar (D) Multipolar

127. The accumulation of uric in the joints causes
(A) Gout (B) Goitre
C) Osteoporesis (D) Osteo-arthritis

128. A type of inversion in which the centromere is included in the invented segment is
(A) Paracentric (B) Pericentric
(C) reciprocal translocation (D) Interstitial deletion

129. A thorn of *Bougainvillea* and a tendril of *Cucurbita* are examples of
(A) Analogous organs (B) Vestigial organs
(C) Homologues organs (D) Underdeveloped organs

130. A plant part which is used to raise tissue culture is called
(A) Implant (B) Explant
(C) Apoplast (D) Protoplast

131. A free living as well as symbiotic nitrogen fixing prokanyote is
(A) Spirogyra (B) Cladophora
(C) Oedogonium (D) Anabaena

132. Which bacteria is most suitable for genetic transformation of dicot plants ?
(A) Agrobacterium tumefaciens (B) Bacillus subtilis
(C) Pseudomonas sp. (D) Xanthomonas sp.

133. Which evidence of evolution is most directly provided by fossils ?
(A) time taken for evolutionar change
(B) cause of evolutionary change
(C) sequence of organism in time
(D) relationship between species

134. A living fossil among pteridophytes is
(A) Rhynia (B) Psilotum
(C) Pteris (D) Tmesipteris

135. Successful establishment of polyploids is an example of
(A) Allopatric speciation (B) Biological speciation
(C) Physiological speciation (D) Sympatric speciation

136. The hardest substance in human body is represented by
(A) Dentine (B) Bone
(C) Enamel (D) Cystolith

137. The part of the brain that organizes behaviou related to fighting, feeding, fleeing and mating is
(A) Hypothalamus (B) Cerebellum
(C) Midbrain (D) Hippocampus

138. Photosynthetically active light has a wavelength ranging between
(A) 390 – 700 nm (B) 500 – 760 nm
(C) 680 – 700 nm (D) 660 – 720 nm

139. In aquatic ecosystem, the zone having abundance of phyto plantation is the
(A) Littoral Zone (B) Limnetic Zone
(C) Benthic Zone (D) Sub-littoral Zone

140. Which of the following is a best example of obligate mutualistic symbiosis ?
(A) *Escherichia coli* in alimentary canal of mammals
(B) *Rhizobium* in root nodules of legumes
(C) Sea anemone attached to the back of hermit crab
(D) Lichens

141. The most threatened reservoir of plants and animals life on earth are called
(A) Vulnerable Biodiversity (B) Extinct Biodiversity
(C) Hot spots of Biodiversity (D) Threatened communities

142. The Kyoto Protocol requires countries to take appropriate measures to reduce
(A) water pollution (B) ozone depletion
(C) overall greenhouse gas emissions (D) global population

143. The following is a saprophytic bryophyte
(A) Cryptothallus mirabilis (B) Mucor pusillus
(C) Sphagnum (D) Monotropa

144. The following is richest in protein content
(A) groundnut (B) spirulina
(C) soyabean (D) gram

145. A blue green algae which is not blue green is
(A) Aulosira (B) Spirulina
(C) Nostoc (D) Trichodesmium

146. Microsporophylls of a gymnosperm are comparable to which structure of angiosperm ?
(A) Anther (B) Filament
(C) Pollen sac (D) Stamen

147. Specific inhibitor of transcription is
(A) Penicillin (B) Chloremphenicol
(C) Aureofungin (D) Actinomycin-D

148. In the mitochondrion, ATP synthesis occurs in
(A) matrix (B) perichondrial space
(C) in association with cristae (D) on the smooth mitochondrial membrane

149. Diagrammatic representation of chromosome at mitotic metaphase stage of dividing all is called
(A) Idiogram (B) Kanyotype
(C) Phenotype (D) Kanyotyping

150. Lamp brush chromosomes are observed in
(A) Salivary gland cells of Drosophila at metaphase stage
(B) Oocytes of amphibians at diplotene stage
(C) Oocytes of amphebians at metaphase stage
(D) Salivary gland cells of Drosophila at anaphase stage

151. In the primary structure of proteins, the nature of molecule depends on
(A) Two or more polypeptide chains
(B) Aggregation of polypeptide chains
(C) A highly bent and folded polypeptide chain
(D) A simple linear polypeptide chain

152. During cytological studies, the best stage for counting the chromosome number is
(A) Metaphase - I (B) Anaphase - I
(C) Diakinesis (D) Zygotene

153. Genotypic ratio in the F-2 population of a monohybrid cross showing incomplete dominance would be
(A) 3 : 1 (B) 1 : 1
(C) 1 : 2 : 3 (D) 1 : 1 : 1 : 1

154. An individual which does not breed true for its characters is called
(A) Homozygote (B) Hybrid
(C) Heterotic (D) Pure line

155. If a gene occurs in more than two allelic states in a certain population, it is called
(A) Multiple allele (B) Polygene
(C) Isoallele (D) Co-dominant allele

156. Degeneracy of the genetic code means that
(A) some codons donot code for any amino acids
(B) some codons act as terminators and some act as initiators
(C) same amino acid may be coded by two or more codons
(D) same code gives message for several amino acids

157. The resolving power of human eye is
(A) 1.0 mm (B) 0.1 mm
(C) 100 angstroms (D) 1000 microns

158. Which of the following proteins is more sweater than sugar ?
(A) Brazzein (B) Papain
(C) Bromelin (D) Mannitol

159. The number of active sites on the larger subunit of ribosome is
(A) 1 (B) 2
(C) 3 (D) 4

160. A piece of potato tuber will form a new plant if it possesses
(A) roots (B) branches
(C) stored food (D) eyes