LEAD TALENT SEACH EXAM - LTSE 2014

A Project by LEAD Trust, Bangalore.

ENTRANCE TEST FOR 10TH STD STUDENTS FOR 2YR RESIDENTIAL COACHING FOR IIT-JEE 2016

AND ADMISSION INTO PUC WITH

PARTNER COLLEGES

SHAHEEN GROUP OF INSTITUTIONS, BIDAR RAJYOTSAVA AWARD - 2013 Bidar

CRESCENT Composite P.U. College Bangalore

ALPINE Composite P.U. College* Bangalore

MS EDUCATION ACADEMY Preparing World Worthy Individuals Hyderabad

NAME OF THE STUDENT :…………………………………………..

NAME OF THE SCHOOL :………………………………………………….

CENTRE CODE :………………………………………………….

10th STD HALL TICKET NUMBER :………………………………………………….

TELEPHONE NUMBER :………………………………………………….

EMAIL ID(as mentioned in the application form):………………………………………………

INSTRUCTIONS TO THE CANDIDATE:

1. This question booklet contains **130** questions. Please verify that this booklet contain all **130** questions in correct serial order.

2. This question paper consists of 4 parts:

Part I Mathematics, Part II Logical Reasoning, Part III Physics, Part IV Chemistry, Part V Biology. It contains questions of the objective type only. Indicate your answers **ONLY** on the OMR sheet. Follow the instructions strictly.

3. Students opting for IIT-JEE 2016 should answer Part I to Part IV only.

Time: 150 mins.

Marks: 100

Students opting for medical 2016 should answer Part II to Part V only.

Time: 150 mins

Marks: 100

4. **NEGATIVE MARKING:** Each correct answer will be awarded one mark. ¼ marks will be deducted for each incorrect answer. More than one answer marked against a question will be deemed as an incorrect response and will be negatively marked.

5. Use of Calculators/logarithmic tables is **NOT ALLOWED.**

> ### PLEASE DO NOT OPEN THE SEAL UNTIL YOU ARE ASKED TO DO SO.

WISH YOU ALL THE BEST!

Part I - Mathematics

1. In a survey of 1000 persons in Bangalore, it was found that 800 read newspaper X, 300 read news paper Y, and 200 read both news papers. How many persons do not read neither X nor Y newspapers?

   a) 200   b) 100   c) 300   d) 400

2. Suresh rides a bicycle from his home to the school. He covers 125 meters in first minute, 135 meters in second minute and so on. If he reaches the school in 10 minutes, find the distance between his home and School.

   a) 1.5 Km   b) 1.6Km   c) 1.7Km   d) 2 Km

3. Find the number of terms in the series 1+4+16+…………if the sum of the series is 341

   a)   5   b) 10   c) 15   d) 20

4. If $\begin{pmatrix} 2x & 1 \\ 0 & 4 \end{pmatrix} + \begin{pmatrix} 3 & 2 \\ 2 & 1 \end{pmatrix} = \begin{pmatrix} 9 & 3 \\ 2 & 5 \end{pmatrix}$ then the value of x is

   a) 0   b) 3   c) 2   d) 9

5. If $A = \begin{pmatrix} 2 & 1 & -5 \\ 0 & 2 & 6 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 0 & 2 \\ 3 & -1 & 4 \end{pmatrix}$ then AB^1 is

a) $\begin{pmatrix} -8 & -15 \\ 12 & 22 \end{pmatrix}$
b) $\begin{pmatrix} 2 & 0 & -10 \\ 0 & -2 & 24 \end{pmatrix}$
c) $\begin{pmatrix} 2 & 0 & -10 \\ 0 & -2 & 24 \end{pmatrix}$
d) $\begin{pmatrix} 8 & 15 \\ -12 & 22 \end{pmatrix}$

6. If $A = \begin{pmatrix} 3 & 1 \\ 2 & 5 \end{pmatrix}$ then $A^2 - 8A + 13\ I$, where I is identify matrix of order 2 is

a) $\begin{pmatrix} 9 & 1 \\ 4 & 25 \end{pmatrix}$
b) $\begin{pmatrix} -5 & -7 \\ -b & -2 \end{pmatrix}$
c) $\begin{pmatrix} 3 & 0 \\ 2 & 0 \end{pmatrix}$
d) $\begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$

7. How many 3 digit numbers can be formed using the digits 2, 3, 4, 5, 6, 7 without repetitions

a) 6   b) 60   c) 120   d) 404

8. There are 6 bowlers and 9 batsmen in a cricket club. In how many ways a team of 11 can be selected so that the team contains at least 4 bowlers?

a) 54   b) 17   c) 170   d) 1170

9. The marks obtained by 10 students in an examination are 43, 48, 55, 57, 42, 50, 47, 48, 58 and 50, then the standard deviation is

a) 5.173   b) 51.73   c) 4.98   d) 49.8

10. The H.C.F of $4x^3 - 3x^2 - 24x - 9$ and $8x^3 - 2x^2 - 53x - 39$ is

a) x - 2   b) x - 3   c) x + 2   d) x + 3

11. The product of two expressions is $a^4 - 9a^2 + 4a + 12$ and their H.C.F is $(a - 2)$, then their L.C.M is

          a) $a^3 + 2a^2 - 5a - 6$ b) $a^2 - 5a - 14$

          c) $a - 4$ d) $a^2 - 4a + 3$

12. If $a + b + c = 2s$ then $b^2 + c^2 - a^2 + 2bc =$

  a) $4S$ b) $S - a$ c) $4S (S - a)$ d) $4S (S + a)$

13. $\dfrac{\sqrt{2}}{\sqrt{3} - \sqrt{2}} + \dfrac{\sqrt{3}}{\sqrt{3} + \sqrt{2}} =$

    a) 2 b) 3 c) $\sqrt{6}$ d) 5

14. The base of a triangle is 4 cms longer than its altitude. If the area of the triangle is 48 sqcm. Then its base and altitude are

    a) 4 , 12 b) 12 ,8 c) 6 , 8 d) 8 , 4

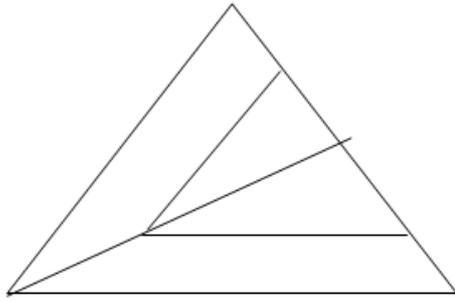15. If the equation $x^2 - (p + 2) x + 4 = 0$ has equal roots then the values of p are

    a) 2, -6   b) 6, -6   c) 2, 8   d) - 8, - 6

16. $(5 \otimes_{12} 2) \otimes_{12} 6 =$

    a) 5   b) 2   c) 6   d) 0

17. In the figure below, if EF || CA and FG || AB then $\dfrac{DE}{EC} =$

 a) $\dfrac{EF}{AB}$ b) $\dfrac{CA}{FG}$ c) $\dfrac{DG}{GB}$ d) $\dfrac{EF}{FG}$

18. A trapezium ABCD has its sides AB ll CD and its diagonals intersect at 0. If the side AB is twice CD, then the ratio of the area of triangle AOB to the Area of triangle COD is

 a) 2 : 1   b) 3 : 1   c) 4 : 1   d) 5 : 1

19. Three circles of radii 3 cms, 4 cm and 5 cm with centre A, B and C respectively touch externally, and then the perimeter of the triangle ABC is

 a) 24   b) 12   c) 20   d) 60

20. Two concentric circles are of radii 13cm and 5 cm. then the length of the chord of the outer circle which touches the inner circle is

 a) 18   b) 24   c) 65   d) 8

21. The diameter of a cone is 10 cm, and the height is 12cm. then the total surface area of the cone is

 a) 180   b) 282.85   c) 120.85   d) 60

22. Total volume of 21 steel balls in a bearing is 88 cm³.then the diameter of each ball is

 a) 2 cm   b) 3 cm   c) 5 cm   d) 8 cm

23. A number consists of two digits whose sum is 10. When 36 is added to the number, its digits are reversed, then the number is

   a) 12   b) 18   c) 37   d) 73

24. The four angles of a quadrilateral are in the ratio 3 : 5 : 7 : 9 then the angles are
   a) 15^0, 45^0 , 60^0 , 75^0 b) 30^0 ,60^0 ,100^0, 170^0

   c) 45^0 , 75^0, 105^0, 135^0 d) 60^0, 75^0, 120^0, 105^0

25. When the fare of a certain journey by an airline was increased in the ratio 5: 7, the cost of the ticket for the journey becomes Rs 1, 421. then the increase in the fare is

   a) Rs. 120   b) Rs. 200   c) Rs.350   d) Rs. 406

26. In what ratio is the line joining the points (4, 2) and (3, -5) divided by the x axis.
   a) 2: 5   b) 2 : 3   c) 5 : 3   d) 4:5

27. A (14 , -2), B (6, -2) , and D (8 , 2) are the three vertices of a parallelogram ABCD , then Coordinates of the vertex C is

   a) (2,0)   b) (0,2)   c) (1,2)   d) (2,2)

28. $\dfrac{1+SinA}{CosA} + \dfrac{CosA}{1+SinA} =$

   a) 2CosA   b) 2 SecA   c) 2 sin A   d) 2 tan A

29. An observer on the top of a cliff 200 m above the sea level observes the angles of depression of the two ships to be 45^0 and 30^0 respectively. If the ships are on the same side of the cliff then the distance between the ships is ($\sqrt{3} = 1.732$).

   a) 200m   b) 346.4 m   c) 146.4m   d) 246.4m

30. A roller having radius 35 cms and length 1 m takes 200 complete revolutions to move once on a play ground. What is the area of the play ground?

   a) 440sqm   b) 700sqm   c) 200sqm   d) 600 sqm

Part II : Logical Reasoning

31. Find the next number in the series: 4, 20, 80, 240, …

      a) 300   b) 480   c) 560   d) 600

32. Find the next number in the series: 1, 8, 27, 64, …

      a) 88   b)108   c) 125   d) 140

33. A, E, I, M, Q, ___, ___

      a) [W,A]   b) [U,Y]   c) [Y,C]   d) [Z,D]
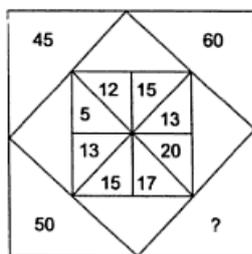
34. Find the odd one out:

      a) Kitten   b) Cub   c)Pony   d) Mare

35. If PROMOTION is coded as RTQOQVKQP, then how will the word SUCCESS be coded?

      a) TVDDFTT   b) PVDDFP   c) UWEEGUU d) VXFFHWW

36. Find the missing number

      a)   55   b) 40   c) 65   d) 70

37. You have a damaged compass. When pointed at Earth's north, its needle points towards east. A person travels some distance with the compass. The compass first showed that he was travelling west, and then travelling south. Which direction did he actually go?

      a) North   b) North-East   c) North-West   d) South-East

38. My mother's father's only daughter's only child is related to me as?

      a)Brother   b) Nephew   c) Myself   d) Son

39. Ibrahim goes to watch a football match and sits next to a man. He finds out that the man is the husband of the sister of Ibrahim's mother. What is the man to Ibrahim?

      a) Father   b) Uncle   c) Nephew   d) Cousin

40. Arrange $\frac{1}{4}, \frac{13}{48}, \frac{25}{96}$ in ascending order

    a) $\frac{1}{4} < \frac{25}{96} < \frac{13}{48}$

    b) $\frac{1}{4} < \frac{13}{48} < \frac{25}{96}$

    c) $\frac{13}{48} < \frac{1}{4} < \frac{25}{96}$

    d) $\frac{25}{96} < \frac{1}{4} < \frac{13}{48}$

41. Simplify $\frac{(3.88*3.88-6.89*6.89)}{3.88+6.89}$

    a) 3.88^2 b) 3.01   c) -3.01   d) 10.77

42. What is $\sqrt{12\% \ of \ \frac{1}{2} \ of \ 24 \ times \ 4}$?

   a) 1.2   b) 5.8   c) 2.4   d) 2.8

43. If LTSE-2015 is conducted on the same date as this year, then on which day will it be?

    a) Sunday   b) Monday   c) Friday   c) Saturday

44. Five rabbits A, B, C, D and E are sitting in a line in a field. A hunter shoots the one in the middle. A was to the left of C. B was to the immediate right of D. There were two rabbits between C and D. E was to the extreme right. Which rabbit got shot?
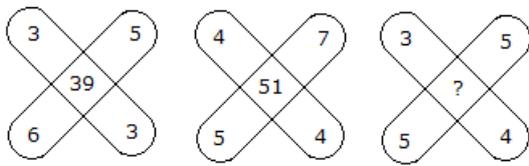
    a)A   b)B   c) C   d) D

45. The figures below show two positions of a dice. Which number would be at the bottom if the number 5 is at top?
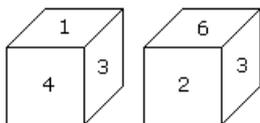
    a) 1   b) 6   c) 2   d) 3

46. Fill in the missing number

a) 75   b) 37   c)65   d) 99

47. Choose the odd one out:

a)Hurricane   b) Avalanche   c) Explosion   d) Flood

48. A student in LTSE 2012 scored 125 marks. He attempted all of the 75 questions in the exam. Each correct answer carried a score of 4 marks and each wrong answer meant losing 1 mark. How many questions did he answer correctly?

a) 38   b) 45   c) 55   d) 40

49. In the series 4, 10, 16, …, what will be the 20th term?

   A) 118   b)200   c)178   d)323

50. In a club, 30% of the members own 2 cars each, 40% of the remaining own three cars each, and the remaining members own only one car each. Which of the following statements is definitely true based on the given statements?

   A) Only 20% of the members own at least one car
   B) 42% of the members own only one car each
   C) 40% of the members own three cars each
   D) 90% of the members own at least one car

51. Find the odd one out

   A) Merchant : Business
   B) Pluto : Planet
   C) Football : Sport
   D) Water : Liquid

52. A farmer had some goats and some chicken. In total he owned 46 animals. The animals had 124 legs in all. How many goats did the farmer have?

a) 24   b) 22   c) 16   d) 20

53. Statement: Some tables are glasses. All trees are tables.

Conclusions: I). Some trees are glasses   II). Some glasses are trees.

Based on the above statement, which conclusion follows?

   A) Only conclusion I follows
   B) Only conclusion II follows
   C) Either I or II follows
   D) Neither I nor II follows

54. Statement: All students are girls. No girl is dull

Conclusion: I). There are no boys in the class   II). No student is dull

Based on the above statement, which conclusion follows?

   A) Both conclusions I and II follow
   B) Only conclusion II follows
   C) Either I or only II follows
   D) Neither I nor II follows

55. Illiteracy : Education :: Flood : ?

   A) Dam   B)Bridge   C)River   D)Monsoon

56. Pointing to a photograph, a man said, "I have no brother or sister but that man's father is my father's son." Whose photograph was it?

   A) His Cousin's   B)His Son's   C)His Own   D)His Nephew's

57. A family consists of six members P, Q, R, X, Y and Z. Q is the son of R but R is not mother of Q. P and R are a married couple. Y is the brother of R. X is the daughter of P. Z is the brother of P. How many children does P have? All children were born to married couples, and no person was married twice.

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

58. If 1 * 7 = 64 and 9 * 3 = 144, what is 5 * 5?

   A) 25   B)100   C)625   B)56

59. Complete the series: 7, 12, 19, 28, 39, ___

   A) 52   B)60   C)49   D)51

60. Sokka is 2 years older than Reeta. Reeta is younger than Ayesha but older than Ramu. Ramu is 3 years younger than Ayesha and 2 years younger than Reeta. If Reeta was 7 years old, how many years old would Ayesha be.

a) 8   b) 5   c) 7   d) none of the above

Part III PHYSICS

61) A vehicle is moving at 200 m/s and an object within the vehicle is moving, relative to the vehicle, at 120 m/s at an angle of 60 to the direction of motion of the vehicle. What is the velocity of the object?
   a) 40 ms^{-1}
   b) 180 ms^{-1}
   c) 280ms^{-1}
   d) 340ms^{-1}

62) A body situated at O moves 4 m towards east to reach a point P. from there it moves 3 m towards north to reach another point Q. The displacements of the body when it is at P and Q respectively are:
   a) 4 m and 3 m
   b) 4 m and 5 m
   c) 4m and 7 m
   d) 4m and 1 m

63) It is difficult to move a cycle with brakes on because
   a) rolling friction opposes motion on road
   b) rolling friction is more than sliding friction
   c) sliding friction opposes motion on road
   d) sliding friction is more than rolling friction

64) A light bulb is placed between two plane mirrors inclined at an angle of 60^0. The number of images formed are:
   a) 6
   b) 2
   c) 5
   d) 4

65) An object is placed on the principle axis of a concave mirror at a distance x from the principal focus. The image is formed at a distance y from the focus. The focal length of the mirror is:
   a) xy
   b) √xy
   c) $\frac{x+y}{2}$
   d) $\sqrt{\frac{x}{y}}$

66) A ray of light entering one face of a glass slab gets refracted at two faces and emerges. Then,
   a) only the incident ray and the refracted ray in glass are in a plane.
   b) only the incident and the emergent rays are in a plane.
   c) only the refracted ray in the glass slab and the emergent ray are in a plane.
   d) incident, refracted and the emergent rays are all in a plane.

67) A short pulse of white light is incident from air to a glass slab at normal incidence. After travelling through the slab, the first colour to emerge is
   a) blue
   b) green
   c) violet
   d) red

68) For an ideal gas the ratio of the volume coefficient of expansion to the pressure coefficient of expansion is
   a) equal to one
   b) greater than one
   c) less than one
   d) is an imaginary quantity

69) If the temperature difference between the opposite faces of a metal block is doubled, then its thermal conductivity
   a) increases
   b) decreases
   c) remains unchanged
   d) may increase or decrease depending on the material

70) An electric fan is switched on in a closed room. The air in the room is
   a) cooled
   b) heated
   c) maintains the temperature
   d) heated or cooled depending on the atmospheric pressure

71) Water is falling on the blades of a turbine at the rate 3000 kg/minute. The height of the falls is 200 m. The power given to the turbine is (assume g = 10ms^{-2}):

a)   200 kW

b)   100 kW

c)   10 kW

d)   1 kW

72) A shell, initially at rest, explodes into two pieces of the same mass. The two pieces will

a)   be at rest.

b)   move with the same speed in the same direction.

c)   move with the same speed in opposite directions.

d)   move with different speeds in the opposite directions.

73) "An object completely immersed in a fluid displaces its own volume of the fluid." This is the statement of

a)   Pascal's principle

b)   Archimedes' principle

c)   Bernoulli's principle

d)   Vernier principle

74) A boat having a length of 5 m and breadth 1 m is floating on a lake. If a man gets on to the boat, the boat sinks by 0.1 cm. The weight of the man is (take g = 10 ms^{-2}):

a)   50 N

b)   9 N

c)   35 N

d)   75 N

75) A stone tied to a thread revolves in a vertical circle. The thread has maximum tension at

a)   the lowest point

b)   highest point

c)   midway between highest point and lowest point

d)   none of the above

76) A merry go round has a radius of 2 m and completes a revolution in 2s. Its acceleration is:
   a) zero
   b) $2\pi^2$
   c) π^2
   d) 160

77) The trajectory of a projectile is a
   a) straight line
   b) circle
   c) ellipse
   d) parabola

78) Iron rails are dusted with sand during rainy season to
   a) reduce friction
   b) increase friction
   c) stop the train
   d) keep it well

79) Attraction of small bits of paper by a comb drawn through dry hair is due to
   a) electrostatic force
   b) electromagnetic force
   c) frictional force
   d) gravitational force

80) The instrument used for measuring the rate of flow of a liquid through a pipe is known as
   a) manometer
   b) venturimeter
   c) barometer
   d) viscousmeter

Part IV - CHEMISTRY

81. The approximate percentage of oxygen(By weight) in ethanoic acid is

a) 53　　　　　b) 48　　　　　c) 60　　　　　d) 32

82) Which of the following metals does not displace hydrogen from dilute sulphuric acid?

a) iron　　　　　b) zinc　　　　　c) silver　　　　　d) magnesium

83) In the equation $Cu + x\ HNO_3 \longrightarrow Cu(NO_3)_2 + yNO_2 + 2H_2O$, the values of x and y are respectively

a) 3 and 1　　　　b) 4 and 2　　　　c) 8 and 6　　　　d) 6 and 2

84) The number of single bonds present in methanol are

a) 7　　　　　b) 5　　　　　c) 6　　　　　d) 8

85) The pH of two solutions A and B are respectively 11 and 6. Which of the following statement is correct with regard to these solutions?

a) A is more acidic than B　　　　　　　b) B is more acidic than A

c) A is more basic than B　　　　　　　c) Both A and B are basic

86) The formula of a chloride of an element is XCl_3 then its nitrate is

a) XNO_3　　　　　　b) $X(NO_3)_2$　　　c) $X(NO_2)_3$　　　d) $X(NO_3)_3$

87) The number of moles of oxygen required for the complete combustion of one mole of methane is

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

88) The fourth and sixth members of alkene series differ by

a) CH_4 b) CH_2 c) CH d) C_2H_4

89) Which of the following contains 6.02×10^{23} molecules (At.mass: H=1, C= 12, O=16, N=14)

a) 12g CH_4 b) 6g H_2O c)17g NH_3 d) 5g C_2H_6

90) Which of the following elements show variable valency?

a) Mg   b)Cu   c) Al   d) Na

91) Which o the following contain least number of elements?

a) Aluminium sulphate   **b)** Ammonium sulphate   **c)** nitric acid   **d)** Potassium bromide

92) The oxygen atom has 8 protons and 8 electrons. The oxide (O^{2-}) will have

a) 6 protons and 8 electrons   b) 8 protons and 6 electrons

c) 10 protons and 8 electrons   d) 8 protons and 10 electrons

93) The molecular formula of an organic compound is C_7H_{14}. It is

a) an alcohol   b) an alkene   c) an alkyne   d) an alkane

94) Which of the following has smell?

a) Hydrogen   b) ammonia   c) nitrogen   d) Oxygen

95) Which of the following metals is used in electrical cables?

a) Iron   b) Zinc   c) Magnesium   d)Copper

96) Which of the following statements is wrong?

a) Iron exhibits variable valency

b) Aluminium is extracted from bauxite

c) Mercury is liquid

d) Sodium is least reactive metal

97) Which of the following contains oxygen?

a) Ethyne   b) Benzene   c) Bauxite   d) Hydrochloric acid

98) Which one of the following has colour?

a) ammonia   b) Bromine   c) Nitrogen   d) Methane

99) The ore of mercury is

a) Haematite   b) bauxite   c) Galena   d) Cinnabar

100) Which of the following contains largest number of atoms?
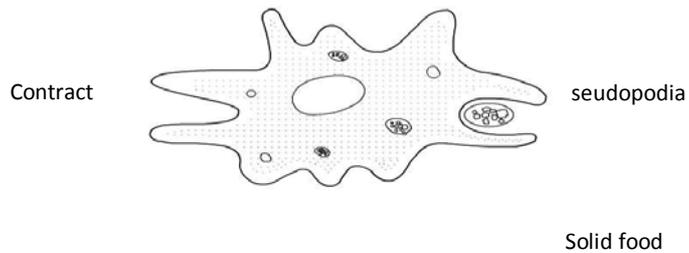
a) 1 mole of hydrogen   b) 4 g of Oxygen

c) 0.5 mole of Nitrogen   d) 10 g of methane

Part V – Biology

101. When breast feeding is replaced by less nutritive food low in proteins and calories; the infants below the age of one year are likely to suffer from.

    (A) Rickets   (B) Kwashiorkor   (C) Pellagra   (D) Marasmus

102. In the diagram, which of the following pro

    Contract   seudopodia

    (A) Exocytosis

    (B) Phagocytosis   Solid food

    (C) Pinocytosis

    (D) Apoptosis

103. This question consists of two statements: Assertion (A) and Reason (R). To answer this question, mark the correct alternative as per the options given below:

    Assertion (A) : The two chains of DNA molecule are anti parallel.
    Reason (R) : The 5'-3' direction of the two DNA chains are opposite.
    (A) If both A and R are true; R is the correct explanation of A.

    (B) If both A and R are true but R is not the correct explanation of A.
    (C) If A is true but R is false.

    (D) If both A and R are false.

104. What is the yield of chemical energy, on average, for every gram of potato waffer, 2 gram of peanuts and every gram of cheese that is consumed?

    (A) 4 kcal each   (B) 4 kcal, 4 kcal and 9 kcal respectively

    (C) 4 kcal, 8 kcal and 9 kcal respectively   (D) 9 kcal, 4 kcal and 4 kcal respectively

105. Match column I and column II and choose the correct combination:

Column I	Column II
(Bacterial disease)	(Causative agent)
(a) Pneumonia	(p) Vibrio cholerae
(b) Tuberculosis	(q) Mycobcterium leprae
(c) Cholera	(r) Yersinia pestis
(d) Plague	(s) Mycobacterium tuberculosis
	(t) Diplococcus pneumonia

(A) a = t, b = q, c = p, d = s

(B) a = t, b = s, c = p, d = r

(C) a = t, b = p, c = s, d = q

(D) a = t, b = s, c = q, d = p

106. The diagram shows a cropping pattern. It can be categorized as

(A) crop rotation.

(B) inter-cropping.

(C) micropropagation.

(D) monoculture.

22

107. Which stages of cell division do the following figures A and B represent respectively?

Fig. A   **Fig. B**

(A)   Prophase   Anaphase

(B)   Metaphase   Telophase

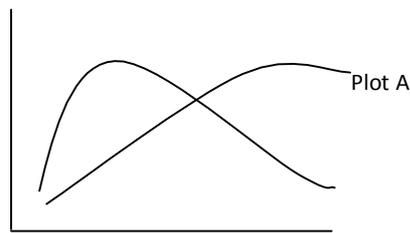(C)   Telophase   Metaphase

(D)   Late Anaphase   Prophase

108. The graph shows the representation of two crop fields (plots A and B). Each plot is treated with chemical fertilizers and/or manures. Analyze the graph carefully and choose the correct option.


Plot A

Plot B

Quantity of amendment

(A) Plot A – Chemical fertilizers, Plot B – Chemical fertilizers

(B) Plot A – Chemical fertilizers, Plot B – Manures

(C) Plot A – Manures, Plot B – Chemical fertilizers

(D) Plot A – Manures, Plot B – Manures

109. The labelling for the slide of leaf peel showing stomata by the four students who made the diagram and tabulated the labels, are as follows. Find out the student who has given the correct answer.
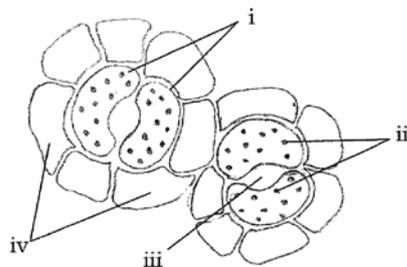
Student	i	ii	iii	iv
P	Stomatal pore	Guard cell	Chloroplast	Subsidiary cell
Q	Guard cell	Chloroplast	Stomatal pore	Subsidiary cell
R	Guard cell	Stomatal pore	Chloroplast	Subsidiary cell
S	Subsidiary cell	Chloroplast	Guard cell	Stomatal pore

(A) Student P   (B) Student Q   (C) Student R   (D) Student S

110. If the sperm and egg cells of a butterfly have 12 chromosomes, how many chromosomes will be there in the maggot larvae?

(A) 6   (B) 18   (C) 24   (D) 3

111. A student completed a genetics exercise by preparing the Punnett square drawn below

[Note: 'T' represents a dominant allele and 't' represents a recessive allele]

TT	Tt
Tt	tt

What were the likely genotypes of the parents?

(A) Parent 1 was homozygous, parent 2 was heterozygous
(B) Parent 1 was heterozygous, parent 2 was homozygous
(C) Both parents were heterozygous
(D) Both parents were homozygous

112. To avoid the danger of burns the body must react quickly. A student carelessly touched a hot radiator with her hand. The following list of changes took place in her hand and arm. They are not in the correct order.

(R) The hand and arm move away quickly from the heat.

(S) Receptor cells and electric impulses along sensory nerves to the brain.
(T) Effector muscles in the arm contract rapidly.

(U) Electrical impulses are sent to the effector muscles in the arm from the brain. (V) A sudden, large amount of heat enters the skin of the hand.

Choose the appropriate sequence of letters that represents correct order.

(A) R S T U V   (B) V S T U R   (C) U S T R V   (D) V S U T R

113. Parthenocarpic tomato fruits can be produced by

(A) Treating the plant with phenyl mercuric acetate.

(B) Treating the plant with low concentrations of gibberellic acid and auxins.

(C) Removing androecium of flowers before pollen grains are released.

(D) Raising the plants from vernalized seeds.

114. Here is a picture, identify the part designated 'A' and 'B'. The hypersecretion of _____ hormone causes softening of bones and lead to osteomalacia.
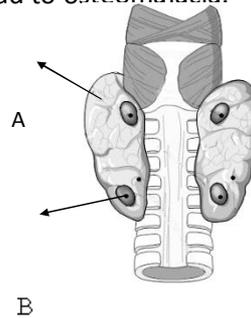
(A) thyroxine

(B) parathormone

(C) thyrosine

(D) calcitonin

115. A person is wearing spectacles with concave lenses for correcting vision. While not using the glasses, the image of a distant object in his case will be formed

(A) on the blind spot.

(C) in front of the retina.

(B) behind the retina.

(D) on the yellow spot.

116. A cross between two true breeding lines one with dark blue flowers and one with bright white flowers produces F_1 offspring that are light blue. When the F_1 progeny are selfed of 1 : 2 : 1 ratio of dark blue to light blue to white flowers is observed. What genetic phenomenon is consistent with these results?

(A) Law of segregation   (B) Incomplete dominance

(C) Law of independent   (D) Random mating
assortment

117. A person passes much urine and drinks much water but his blood glucose level is normal. This condition may be the result of

(A) a reduction in insulin secretion from pancreas.

(B) a reduction in vasopressin secretion from posterior pituitary.

(C) a fall in the glucose concentration in urine.

(D) an increase in the secretion of glucagon.

118. Which of the following changes is most likely to occur if the sparrow population decreases? (A) The fox population decreases.

(B) The hawk population increases.

(C) The grasshopper population competes less with the praying mantis.

(D)The hawk population and the fox population prey more heavily on grasshoppers.

119. Which of the following is the correct sequence for the stages in Prophase I? (A) diplotene, diakinesis, pachytene, zygotene, leptotene.

(B) diakinesis, diplotene, pachytene, leptotene, zygotene. (C) leptotene, zygotene, pachytene, diplotene, diakinesis. (D) leptotene, zygotene, pachytene, diakinesis, diplotene.

120. The respiratory quotient is

(A) $RQ = \dfrac{\text{volume of } O_2 \text{ evolved}}{\text{volume of } CO_2 \text{ evolved}}$ consumed

volume of CO_2 consumed

(B) $RQ = \dfrac{\text{volume of } O_2}{\text{volume of } CO_2 \text{ consumed}}$

(C) $RQ = \dfrac{\text{volume of } CO_2 \text{ evolved}}{\text{volume of } O_2 \text{ consumed}}$

CO_2 consumed

(D) $RQ = \dfrac{\text{volume of}}{\text{volume of } CO_2 \text{ evolved}}$

volume of O_2 consumed

Read the passage given below and answer questions from 21 to 23 by choosing the correct alternative.

Pollutant gases have an adverse effect on the environment and on our health. The amount of these gases have been steadily increasing over the years. The table given below shows the source and the amount of some pollutant gases produced by human activities.

Pollutant gas	Source	Amount produced per year (millions of tonnes)
CO_2	Vehicle exhaust furnaces, burning coal	350
SO_2	Oil industries	200
NO_2	Vehicle exhaust furnaces	55
Hydrocarbons	Vehicle exhaust furnaces, industries	90

121. Which one of the following statement/s is correct?

   (A) The total sulphur dioxide and nitrogen dioxide produced per year is 145 million tones.
   (B) CO_2 is produced by industries

   (C) The combined total pollutant gases produced by NO_2 and hydrocarbons is less than the total pollutant gases produced by SO_2

   (D) Hydrocarbons are produced by vehicle exhaust gases and industries.

122. From the above table, identify the greenhouse gas.

   (A) CO_2 (B) SO_2 (C) NO_2 (D) hydrocarbons

123. Which of these gases contribute to the formation of acid rain?

   (A) CO_2 (B) SO_2 (C) CH_4 (D) hydrocarbons

Read the passage given below and answer questions from 24 to 26 by choosing the correct alternative/s

Our body has the defence system to protect against invading microbes. The outermost line of defence is the barrier that prevents the entry of microbes into the body and if they enter, there are phagocytic cells which will kill the microbes. This forms the local defence system of the body. The innermost line of defence includes formation of specific antibodies that combine with the antigen (microbe) and then destroy it. This is called specific immunity. This specific immunity can also be triggered artificially through vaccination.

124. Which is the mechanical barrier that prevent microbial entry into our body?

(A) Mucus in gastrointestinal tract   (B) HCl

(C) Tears   (D) Skin

125. Identify the different secretion of our body that have antimicrobial properties.

(A) Tears   (B) Sputum   (C) Mucus   (D) Intestinal juice

126. In general vaccines are not

(A) 100 % safe   (B) 100 % effective   (C) not useful   (D) none of these

Multiple choice questions with one or more than one correct alternative/s

127. DNA fingerprinting can solve

(A) identification of a person   (B) maternity dispute

(C) paternity dispute   (D) land dispute

128. To brighten her home in the winter a woman decides to force an iris to bloom, to achieve this she should (A) expose the plant to long period of darkness

(B) expose the plant to long short of darkness (C) interrupts a long period of darkness
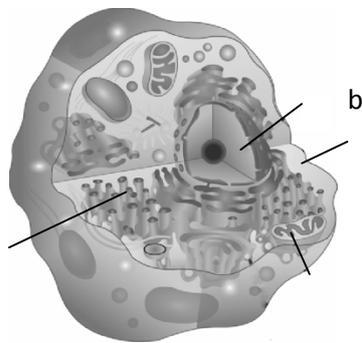
(D) water it generously

129. Choose the letter/s that indicate/s the organelle/s that contain/s DNA

(A) a

(B) b

(C) c

(D) d

b

c

130. A cell is dipped in 0.5 M sucrose solution has no effect but when the same cell will be dipped in 0.5 M NaCl solution the cell wall

(A) increase in size

(C) will be turgid

(B) decrease in size

(D) will be plasmolysed