LEAD TALENT SEACH EXAM - LTSE 2013

A Project by LEAD Trust, Bangalore.

ENTRANCE TEST FOR 10TH STD STUDENTS FOR 2YR RESIDENTIAL COACHING FOR IIT-JEE 2015
AND
ADMISSION INTO PUC AT SHAHEEN PU COLLEGE AND PARTNER COLLEGE

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 **110** questions. Please verify that this booklet contain all **110** questions in correct serial order.

2. This question paper consists of 4 parts:
Part I Mathematics and Logical Reasoning, Part II Physics, Part III Chemistry, Part IV 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 2015 should answer Part I, Part II and Part III only.
Time: 120 mins.
Marks: 80
Students opting for medical 2015 in Shaheen PU College should answer Part II, Part III, Part IV only.
Time: 115 mins
Marks: 70

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. The angles of a triangle are in A.P. The smallest angle is 30^0 then the triangle is

   (a) Isosceles   (b) equilateral   (c) Right angled   (d) equiangular

2. The sum of all natural numbers between 91 and 170 which are divisible by 5 is

   (a) 1950   (b) 1850   (c) 2050   (d) 2150

3. How many 3-digit numbers can be formed by using the digits 3, 4, 5 and 6 without repetitions?

   (a) 14   (b) 24   (c) 34   (d) 54

4. A box contains 5 blue and 4 red marbles. In how many ways can 4 marbles be drawn so as to include 2 red marbles?

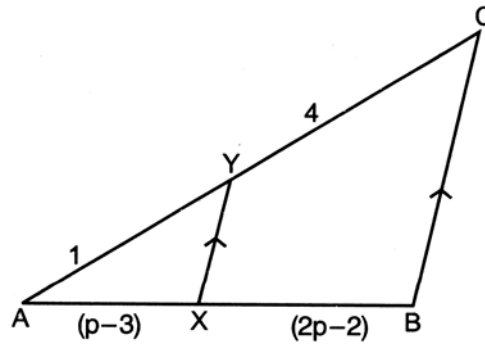   (a) 30   (b) 40   (c) 50   (d) 60

SPACE FOR ROUGH WORK

5. The performance of 20 students in an examination in English, Mathematics and Science is given below.

Subject	Mean Score $\left(\overline{X}\right)$	S.D. Score (σ)
English	56	5.75
Mathematics	73	6.25
Science	62	6.0

Using this data determine in which subject their performance is more consistent?

(a) English   (b) Mathematics   (c) Science   (d) None

6. The H.C.F of $3x^4 + 6x^3 - 12x^2 - 24x$ and $4x^4 + 14x^3 + 8x^2 - 8x$ is

(a) x (b) $6x^2$ (c) $x^2 + 4x + 4$ (d) $x(x^2 + 4x + 4)$

7. If $a + b + c = 2s$ then $s(s-a) + s(s-b) + s(s-c) = $.

(a) s^2 (b) $2s^2$ (c) $4s^2$ (d) $5s^2$

8. Sum of a number and its reciprocal is $5\dfrac{1}{5}$ then the number is

(a) 4 or $\dfrac{1}{4}$ (b) 3 or $\dfrac{1}{3}$ (c) 5 or $\dfrac{1}{5}$ (d) 6 or $\dfrac{1}{6}$

9. In the figure below XY $||$ BC. AX= $p-3$, BX=$2p-2$ and $AY:CY = 1:4$, then 'p' is

(a) 3   (b) 4   (c) 5   (d) 6

10. A man, whose height is 1.5m standing 8m from a lamp post, observes that his shadow cast by the light is 2m in length, then the height of the lamp post is
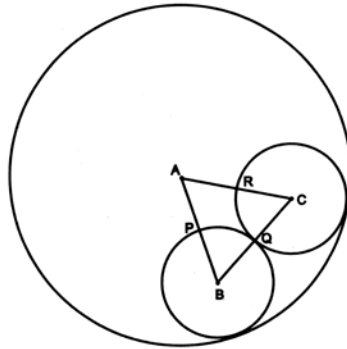
(a) 7.5 m   (b) 6.5 m   (c) 5.5 m   (d) 4.5 m

11. Three circles with centres A, B and C touch each other as shown in the figure. If the radii of these circles are 8cm, 3cm and 2cm respectively, then the perimeter of the triangle ABC is

    (a) 11 cm   (b) 10 cm   (c) 15 cm   (d) 16 cm

12. In the regiment, the ratio of number of officers to the number of soldiers was 3 : 31 before a battle. In the battle 6 officers and 22 soldiers were killed. The ratio between the number of officers and the numbers of soldiers now is 1 : 13. then the number of officers and soldiers in the regiment before the battle were

    (a) 3 and 13   (b) 21 and 217   (c) 21 and 317   (d) 7 and 31

13. If $\dfrac{x^3 + 3x}{3x^2 + 1} = \dfrac{341}{91}$, then $x =$

    (a) 14   (b) 13   (c) 12   (d) 11

14. Polynomial $x^3 - ax^2 + bx - 6$ leaves remainder -8 when divided by x-1 and x-2 is factor of it, then the values of 'a' and 'b' are

   (a) -1 and -5   (b) -1 and 5   (c) -2 and -5   (d) 2 and -5

15. If $A = \begin{bmatrix} 2 & -1 \\ -1 & 3 \end{bmatrix}$, then $A^2 - 3A + 2I$, where I is a unit matrix of order 2 is

   (a) $\begin{bmatrix} 1 & -2 \\ -2 & 3 \end{bmatrix}$ (b) $\begin{bmatrix} -1 & 2 \\ 2 & -3 \end{bmatrix}$ (c) $\begin{bmatrix} -1 & -2 \\ 2 & 3 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & 2 \\ -2 & -3 \end{bmatrix}$

16. The co-ordinates of the circumcentre of triangle ABC, whose vertices A, B and C are (4,6), (0,4) and (6,2) respectively is

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

17. The co-ordinates of the point of intersection of the medians of triangle ABC; given
    A = (− 2,3), B = (6,7) and C = (4,1) is

    (a) (8, 11)　　　　　　(b) $\left(\dfrac{8}{3},\dfrac{11}{3}\right)$　　　　　(c) $\left(\dfrac{8}{5},\dfrac{11}{5}\right)$　　　　　(d) (5, 4)

18. $\dfrac{\cos A}{1-\tan A}+\dfrac{\sin^2 A}{\sin A-\cos A}=$.

    (a) $\tan A+\sin A$　　　　(b) $\cot A+\cos A$　　　(c) $\sin A+\cos A$　　　(d) $\tan A+\cot A$

19. Two people standing on the same side of a tower in a straight line with it, measure the
    angles of elevation of the top of the tower as 25^0 and 50^0 respectively. If the height of the
    tower is 70m. then the distance between the two people is

    (a) 91.38 m　　　　　(b) 81.38 m　　　　(c) 101.38 m　　　　(d) 80 m

20. For the same amount of work, A takes 6 hours less then B. If together they complete the
    work in 13 hours 20 minutes then how much time will B alone take to complete the work.

    (a) 20 hours　　　　　(b) 25 hours　　　　(c) 30 hours　　　　(d) 35 hours

Part 1 - LOGICAL REASONING

21. Fact 1: All horses are good runners
    Fact 2: Some horses are good swimmers
    Fact 3: Most horses sleep while standing
    Given that the above are all true statements, which of the following are also true?
    I) Horses which are good swimmers also sleep while standing
    II) All horses which don't sleep while standing are good runners
    III) Most horses that are good swimmers sleep while standing
    (a) II   (b) I and II   (c) III   (d) I and III

22. Chotu, Motu, Lambu and Tinnu are watching a cricket game. Tinnu was sitting on seat 23, Lambu was sitting to the right of Tinnu on seat 24. Motu was sitting to the right of Tinnu and Lambu was sitting to the left of Motu. Which seat was Motu sitting on?

    (a) 25   (b)26   (c) 22   (d) Difficult to Say

23. A person eats one tablet every day and eats an extra two tablets on Sundays. The person has been doing this since the 4th of May which was a Saturday. By the 6th of July how many tablets will he have eaten if he did not eat any on the 14th, 15th and 16th of June?

    (a) 59   (b)77   (c) 61   (d) 89

SPACE FOR ROUGH WORK

24. Given the following:
    bomstylectus = appalled
    bomstypectus = apparatus
    bodamstypelus = appropriate
    What is appellate?

    (a) bomdictus,   (b) bomastypictus   (c) bodalyptus   (d) bomcyclus

25. Some inmate(s) from a prison escaped in a police van. It is known that they could be none other than Monty, Ponty and Sonty. Sonty doesn't know how to drive. Ponty doesn't go anywhere without Monty. Who do you think escaped the prison?
    Answer:
    (a) {Monty, Ponty and Sonty} (b) {Monty and Ponty}   (c) Monty   (d) Difficult to say

26. Each person in a town are either always liars or always truthful. Person A says Person B is a liar. Person B says "neither of us is a liar". Who is a liar?
    (a) Person B   (b) Both A and B   (c) Neither A nor B   (d) A

27. Find the odd one out: SONG, FLOP, HARD, EVEN

    (a) SONG   (b) FLOP   (c) EVEN   (d) HARD

28. A caterpillar is at the bottom of a vertical tube that is 18 cm tall. It climbs 3 cm every minute but then slips 2 cm. How many minutes will it take for it to reach the top of the tube?

(a) 15 (b) 18 (c)16 (d) 17

29. There are three rooms, one of which contains the treasure. Outside of the first room is written "The treasure is in the second room". Outside the second and third rooms, it says "The treasure is here". Only one of the signs is true. Which room has the treasure?
(a) Third (b) First (c)Second (d) Difficult to say

30. File in the blank in the series:
LV, NS, QO, __

(a) OQ (b) JU (c) UJ (d) TK

31. If 1 = 5,
2 = 25,
3 = 325,
4 = 4325,
5 = ?

(a) 54325 (b) 52345 (c) 55555 (d) None of These

32. Each person in a town are either always liars or always truthful. Person A says Person B is a liar. Person B says "both of us are truthful". Who is a liar?

    (a)Neither   (b)Both   (c) Person B   (d)Person A

33. Other than noon and midnight, how many times do the hour and the minute hands cross each other?

    (a) 10   (b)11   (c) 12   (d) 9

34. Given the following:

	1	2	3	4	5
A					
B					
C					
D					
E					

A + D = C

E ≠ 5

D + E = B + C

D + 1 = C

Find the values of A, B, C, D and E:

(a) {1, 4, 5, 3, 2}   (b) {2, 3, 1, 5, 4}   (c) {3, 2, 4, 5, 1}   (d) {1, 2, 5, 4, 3}

35. Find out the next three letters of this riddle? O T T F F S S __ __ __

    (a) T T U   (b) E N T   (c) U U V   (d) T U U

36. Which number does not belong with the others?
    1999, 2000, 2001, 2002

    (a) 1999   (b) 2001   (c) 2002   (d) 2000

37. Choose the pair of words that matches the relationship between Tire and Bicycle
    I) Pen and Book
    ii) Petal and Flower
    iii) Blanket and Bed
    iv) Light and Bulb
    (a)ii   (b)I   (c)iii   (d)iv

38. Find the odd one:
    i) CFIL
    ii) PSVX
    iii) JMPS
    iv) ORUX
    (a)ii   (b)I   (c)iii   (d)iv

39. 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) 45   (b)55   (c)40   (d) 35

40. Rohit, Kishore, Suhail and Anand are playing carroms. Rohit and Suhail are partners. Anand is to the right of Suhail who is facing West. Which direction is Kishore facing?
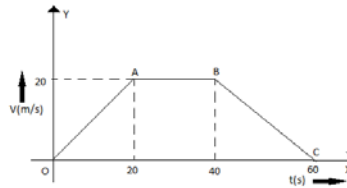   (a) North   (b)West   (c) South   (d) East

PART II - PHYSICS

41. Study of highly ionised matter is known as:
    a) Plasma physics
    b) Cryogenics
    c) Solid state physics
    d) Quantum mechanics

42. Vander Waal's equation of state is $\left(P + \frac{a}{V^2}\right)$ (V-b) = nRT. The dimensions of a and b are:
    a) $[ML^3 T^3], [M^1 L^3 T^0]$
    b) $[ML^5 T^2], [M^0 L^3 T^0]$
    c) $[M^2 LT^2], [M^1 L^3 T^2]$
    d) $[ML^2 T], [ML^2 T^2]$

43. A car covers the first ½ of the distance between 2 places at a speed of 30 kmph and the second ½ at 60 kmph. Its average speed is
    a) 45 kmph
    b) 30 kmph
    c) 90 kmph
    d) 40 kmph

44. The velocity time graph of a body is as shown.
    Distance travelled by it in 60 sec is
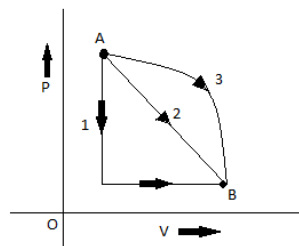   a) 400 m
    b) 100 m
    c) 200 m
    d) 600 m

45. A person of mass 60 kg is in a lift moving down with an acceleration of 4.9 ms^{-2}. His apparent weight is
    a) 90 kg wt
    b) 45 kg wt
    c) 60 kg wt
    d) 30 kg wt
46. 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
47. Iron rails are dusted with sand during rainy season to
    a) Reduce friction
    b) Increase fiction
    c) Stop the train
    d) Keep it well
48. 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

49. The instrument used for measuring the rate of flow of a liquid when the motion of the liquid is steady is called
    a) Manometer
    b) Venturimeter
    c) Barometer
    d) Viscousmeter

50. A certain mass of an ideal gas is taken from state A to state B along the paths 1, 2 and 3 separately as shown in the diagram. If W_1, W_2 and W_3 are the works done by the gas along the paths 1, 2 and 3 respectively then
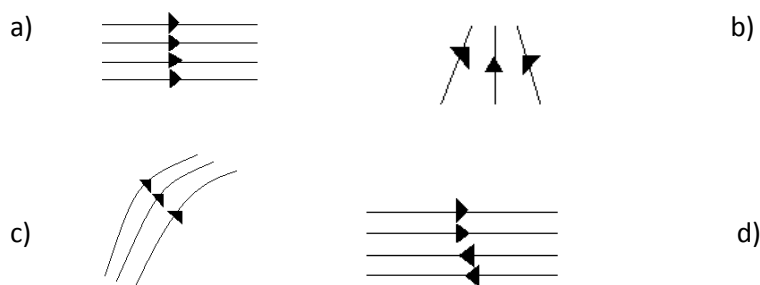   a) $W_1=W_2=W_3$
    b) $W_1<W_2$, $W_3>W_2$
    c) $W_1>W_2>W_3$
    d) $W_1<W_2$, $W_2>W_3$

51. A girl is swinging on a swing in her sitting position. If she suddenly stands up and continue to swing, the period of swing
    a) Decreases
    b) Increases
    c) Remains constant
    d) Becomes zero

52. A convergent beam when falls on a concave mirror appears to converge at a point distant 0.2m behind the mirror. If the focal length of the mirror is 0.1m, the image distance is (in m)
    a) 0.1
    b) -0.067
    c) 0.067
    d) 0.2

53. The unit of power of a spherical surface is
    a) Newton
    b) Pascal
    c) Dioptre
    d) Joule

54. Nucleus of $_{92}U^{235}$ contains
   a) 92 protons and 143 neutrons
   b) 92 neutrons and 143 protons
   c) 92 protons and 235 neutrons
   d) 92 neutrons and 235 protons

55. The phenomenon of superconductivity was discovered by
   a) Ohm
   b) Michel Faraday
   c) Kamerlingh onnes
   d) Maxwell

56. The electric field lines in a uniform electric field are as shown in the figure:

57. The persistent of audible sound in an auditorium is due to the
   a) Nature of the source emitting sound
   b) Multiple reflections
   c) Size of the hall
   d) Design of the building

58. The approximate location of an earthquake can be determined by a
   a) Seismograph
   b) Radio
   c) Television
   d) Radar

59. The period of a geo-stationary satellite is
   a) 24 hours
   b) 365.25 days
   c) 1 day
   d) 1 hour

60. A piece of paper and an iron piece are dropped simultaneously from the same point. They will reach the ground simultaneously if they
   a) Are of the same weight
   b) Fall very far
   c) Have the same velocity
   d) Are in vacuum

PART III - Chemistry

61. The probable pH of a very dilute solution of sodium hydroxide is
a) 5   b) 6   c) 7   d) 8

62. Which of the following does not contain oxygen?
a) Nitric acid   b) Sulphuric acid   c) Hydrochloric acid   d) Acetic acid

63. An example of liquid element is
a) Ag   b) Hg   c) H_2 d) P

64. The ore of mercury is
a) Bauxite   b) Haematite   c) Cinnabar   d) galena

65. Which of the following has smell?
a) H_2 b) O_2 c) Cl_2 d) N_2

66. Which of the following show variable valency?
a) Ca   b) Fe   c) Mg   d) Zn

67. Which of the following metals do not displace hydrogen from dilute acids?
a) Al   b) Fe   c) Ag   d) Mg

68. The total number of covalent bonds present in one molecule of ethanol is
a) 4   b) 5   c) 6   d) 7

69. Which of the following compounds contain least number of oxygen atoms in its molecule?
a) magnesium oxide   b) calcium carbonate
c) zinc nitrate   d) aluminium sulphate

70. The formula of a divalent metal carbonate is
a) M_2CO_3 b) $M(CO_3)_2$ c) MCO_3 d) M_3CO_3

71. The nitrogen atom has 7 protons and 7 electrons. The nitride ion (N^{3-}) will have
a) 4 protons and 10 electrons
b) 7 protons and 10 electrons
c) 10 protons and 7 electrons
d) 4 protons and 7 electrons

72. The total number of atoms present in 0.1mole of sucrose ($C_{12}H_{22}O_{11}$) is
a) 6.02×10^{23} b)2.7×10^{24} c)2.7×10^{23} d)6.02×10^{22}

73. Which one of the following has maximum number of molecules?
a) 1g of CO_2 b) 1g of N_2 c) 1g of CH_4 d) 1g of H_2
 As the reaction progress, the rate of reaction
a) increases   b) decreases   c) remains constant   d) first increases, then decreases

74. Which among the following has all the three types (ionic, covalent and coordinate) bonds?
a) Potassium chloride   b) ethane   c) ammonium bromide   d) ammonia

 75. Which of the following statements is wrong about alkenes?
a) They are all unsaturated hydrocarbons.
b) On complete combustion form CO_2 and H_2O.
c) They do not undergo addition reactions.
d) They can undergo addition as well as substitution reactions.

76. The number of moles and number of molecules present in 2.8g of second member of alkene series are respectively
a) 0.2 and 6×10^{23} b) 0.1 and 6×10^{22} c) 0.05 and 6×10^{23}
d) 0.1 and 6×10^{21}

77. Sodium bicarbonate on heating decompose forming sodium carbonate. The mass of sodium carbonate obtained by heating 33.6g of sodium carbonate is
a) 21.2g   b) 10.6g   c) 16.8g   d) 8.4g

78. The functional group of the organic compound present in vinegar is
a) alcohol   b) aldehyde   c) carboxylic acid   d) amine

79. The molecular formula of fertilizer super phosphate is $Ca(H_2PO_4)_2$. The percentage of calcium in the super phosphate is : (H=1, O=16, P=31, Ca=40)

a) 26.5   b) 54.7   c) 40   d) 45.5

80. The molecular formula of an organic compound is $C_{10}H_{18}$. It is
a) An alkyne   b) an alkane   c) an alcohol   d) an alkene

Part IV – BIOLOGY

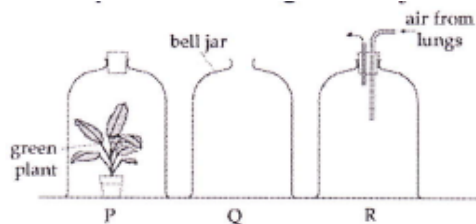81. A partial food web is shown below.

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.

82. In ari experiment, three glass belljars were set up as shown in the diagram.
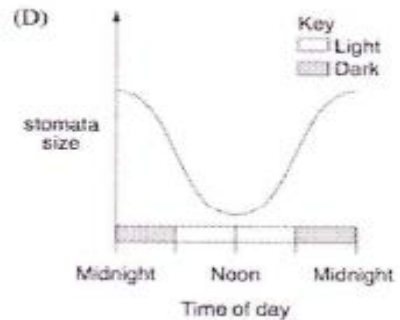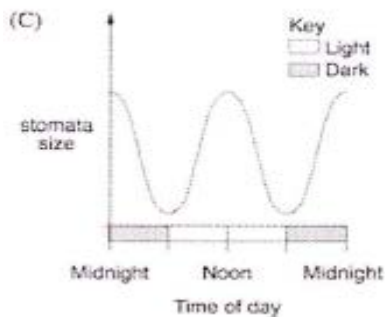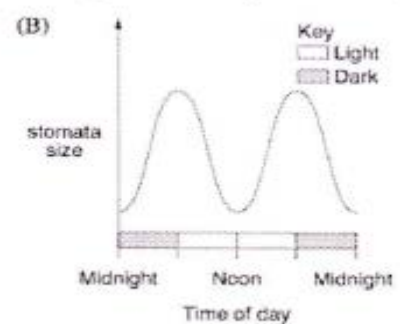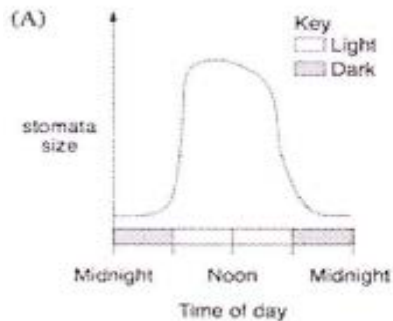

P – Left in sunlight for 8 hours.
Q – Left open to the air for 8 hours.
R – Air breathed out by a student for 5 minutes.

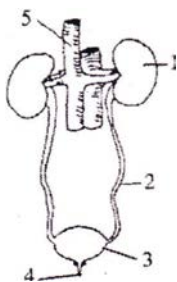At the end of the experiment, which bell jar has most oxygen and which has the least?

	Most oxygen	Least oxygen
(A)	P	Q
(B)	P	R
(C)	Q	P
(D)	R	P

83. Experiments were carried out on plants living in different environments to measure the size of the leaf
stomata at different times of the day. Previous investigations had shown that plant transpires more water
when the size of the stomata is larger. Which graph best represents a plant living in a dry environment?

84. In the diagram of the excretory system of human given below certain parts have been indicated by numericals. Choose the answer which shows correct labeling.
(A) 1 = urinary bladder, 2: urethra 3: = kidney, 4 = inferior vena cav4 5 : ureter.
(B) 1 = kidney, 2 = ureter,3 : urinary bladder, 4 = urethra, 5 : inferior vena cava.
(C) I = kidney, 2 : urethr1 3 = urinary bladder, 4 = ureter, 5 : inferior vena cava.
(D) I : kidney, 2 = inferior vena cava, 3 : urinary bladder, 4 = urethra, 5 : ureter.

85.

The following diagram shows the stomatal apparatus. Identify the parts labeled as i, ii, iii and iv.

Choose the correct answer from the following:

(A) i – subsidiary cells, ii – chloroplasts, iii – stoma, iv – guard cells.

(B) i – guard cells, ii – stoma, iii – chloroplasts, iv – subsidiary cells.

(C) i – subsidiary cells, ii – stoma, iii – chloroplasts, iv – guard cells.

(D) i – guard cells, ii – chloroplasts, iii – stoma, iv – subsidiary cells.

86. A drop of each of the following, is placed separately on four slides. Which of them will not coagulate?
(A) Whole blood from pulmonary vein
(B) Blood plasma
(C) Eilood serum
(D) Sample from the thoracic duct of lymphatic system

87. Feeling the tremors of an earthquake a scared resident of seventh floor of a multistoryed building starts
climbing down the stairs rapidly. Which hormone initiated this action?
(A) Gastrin
(B) Thyroxin
(C) Adrenaline
(D) Glucagon

88. 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

89. The scientific name for the wood'chuck is Marmota monax and the scientific name for the long-tailed
marmot is Marmota caudata. Which of the following statements describes the taxonomic relationship
between the woodchuck and the long-tailed marmot?
(A) They belong to different phyla.
(B) They belong to the same genus.
(C) They belong to the same species.
(D) They belong to different families.

90. A single celled rod-shaped organism has been isolated from marine sediment. The features you look for,

that might indicate that it is a prokaryote include

(A) absence of cell wall and ribosomes.

(B) absence of cell wall and 'true nucleus'.

(C) absence of 'true nucleus' and membrane bound organelles.

(D) absence of 'true nucleus' and ribosomes.

91. Which one of the following is a matching pair of a body feature and the animal possessing it?

(A) Ventral heart - Scorpion

(B) Post-analtail - Octopus

(C) Ventral Central nervous system - Leech

(D) Pharyngeal gill slits absent in embryo – Chamaeleon

92.

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

	Column I (Bacterial disease)		Column II (Causative agent)
(a)	Pneumonia	(p)	*Vibrio cholerae*
(b)	Citrus canker	(q)	*Mycobcterium leprae*
(c)	Cholera	(r)	*Yersinia pestis*
(d)	Leprosy	(s)	*Xanthomonos citri*
		(t)	*Diplococcus pneumonia*

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

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

93. A cricket player is fast chasing a ball in the field. Which of the following groups of bones are directly

contributing in this movement?

(A) Femur, malleus, fibia, metatarsals.

(B) Pelvis, ulna, patella, tarsals.

(C) Sternumo femur, fibia, fibula.

(D) Tarsals, femur, metatarsals, fibia.

94. This question consists of two statements: Assertion (A) and Reason (R). To answerthis question, mark

the correct alternative as per the options given below:

Assertion (A): The S-A node acts as pace maker

Reason (R): The S-A node is located in the wall of the right atrium near the inter-atrial septum.

(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.

95. If you could inject (using a very tiny needle) a concentrated solution of sucrose, say 1.0 molar, into a
plant cell's vacuole what would happen? 0.1 M is far more concentrated than sucrose in the cytoplasm.
(A) The cell would start to bulge.
(B) The cell would divide.
(C) The cells hydrostatic pressure would decrease.
(D) The cell would shrink away from its cell wall.

96. If the body cells of dog have 78 chromosomes, how many are there in the sperm cells? Also find the
number of mitotic divisions required to produce 128 cells from a single chicken cell?
(A) 39 chromosomes; 14 divisions
(B) 78 chromosomes; 7 divisions
(C) 39 chromosomes; 7 divisions
(D) 78 chromosomes; 14 divisions

97. Archana, who is 32 years old, consumes 1900 calories per day and does no exercise. She weighs
150 pounds and she is 5.3 feet tall. Choose the correct answer regarding her BMI.
[Note: 1 pound :0.45 kg; 1 foot = 30.4 cm]
(A) Archana's BMI is 40.4 and she is over weighed.
(B) Archana's BMI is 26.01 and she is over weighed.
(C) Archana's BMI is 40.4 and she is obese.
(D) Archana's BMI is 28.86 and she is obese.

98. In 1950, E.E. Chargaff formulated important generalizations about DNA structure and they are called

"Chargaffs rule" in his honour. According to Chargaff,
- purines and pyrimidines are always in equal amounts, i.e., A + G = T + C.
- amount of adenine is always equal to that of thymine and amount of guanine is always equal to that
of cytosine, i.e., A=T and G = C.
lf 22% of nitrogenous base in a sample of DNA is thymine what percentage should be cytosine?
(A)22% (B)28% (C)1s% (D) 44%

99. In a monohybrid cross of pea plants, the height (tall and dwarf) is studied. In F2 generation, 100 plants
are obtained. The number of plants which will be dwarf in F2 generation will be
(A) 2s. (B) s0. (c) 7s. (D) 100.

100. Tree -+ Caterpillar -+ Robin -+ Cat represents a food chain. In this food chain, if the tree can provide
100,000 calories of enerry, how much calories of energy will be available to the robin and the cat?
(A) 10000 and 1000 calories respectively
(B) 1000 and 100 calories respectively
(C) 1000 and 10000 calories respectively
(D) 100 and 1000 calories respectively

Read the passage given below and answer questions from 101 to 103 by choosing the correct alternative.

Heart is the centre of the cardiovascular system. The right half receives and pumps deoxygenated blood and the left half receives and pump oxygenated blood. This type of circulation is called double circulation. The volume of blood pumped by a ventricle during each systole is called stroke volume. The stroke volume in a resting adult is around 70 ml and the heart beat rate is about 72 per minute. The volume of blood pumped from the left ventricle into the aorta per minute is called the cardiac output. It is calculated as

Cardiac output= Stroke volume x Heart beat per minute
= 70 ml x 72 beats/minute
=5040 ml /minute

101. Based on its function, the heart is often referred to as a "double pump".Which of the following would
explain this?
(A) The heart has two sets of valves.
(B) The heart is controlled by both nerves and hormones.
(C) The heart moves blood through two circulatory pathways.
(D) The heart moves blood containing both nutrients and wastes.

102. Read the statements and select the option which best describes the process that occurs during systemic
Circulation.

(a) The left atrium receives the oxygenated blood through the pulmonary veins. The left ventricle pumps
the blood through the aorta to various parts and the deoxygenated blood reaches right atrium.
(b) The left atrium receives the oxygenated blood through pulmonary veins and pumps the blood through the aorta to various parts and the deoxygenated blood reaches right atrium.
(c) The left atrium receives deoxygenated blood and pumps into left ventricles which in turn pumps into
pulmonary artery for oxygenation.
(d) The right atrium receives the deoxygenated blood and pumps into pulmonary artery for oxygenation.

(A) a is correct
(B) b is correct
(C) c and d is correct
(D) d is correct

103. If the stroke volume is 80 ml and the cardiac output is 6000 per minute. Calculate the heartbeat per
rninute.
(A) 74 beats per minute
(B) 75 beats per minute
(C) 86 beats per minute
(D) 76 beats per minute

Read the passage given below and answer questions from 104 to 106 by choosing the correct alternative.

Food is essential for life. It should be pure, nutritious and free from any type of adulteration for proper maintenance of human health. Every consumer wants to get maximum quantity of a commodity for as low a price as possible. This attitude of the consumer being coupled with the intention of the traders to increase the margin of profit, where the quality of the commodity gets reduced through addition of a base substance and/or removal of vital elements also commonly known as food adulteration. To prevent adulteration of foodproducts, our government has issued certain laws. In India, the Bureau of Indian standards carries out the certification of food products at the manufacture's end.

104. What adulterants can be present in the following products?
(i) Sweet (ii) Honey (iii) Sugar (iv) Ghee
(A) i - metanil yellow ii - jaggery iii - chalk powder iv - animal bodies fat
(B) i - sugar ii - chalk powder iii - chicory iv - white powder
(c) i - argemone seeds ii - metanil yellow iii - water iv - vanaspathi
(D) i - metanil yellow ii - white powder iii - chalk powder iv – vanaspathi

105. A person finds that the food packet he had purchased is adulterated. The person wants to bring this into notice of higher authorities and want the shopkeeper to be punished. What do you suggest the person should do to take action against the shopkeeper?

    (A) Food Prevention Act   (B)   Food Safety Act

    (c) Prevention of food adulteration act   (d)   Food standard act

106. Which one of the following is an intentional adulteration?
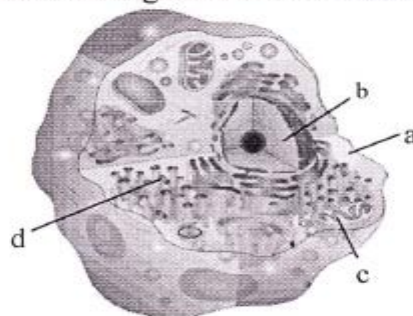   (A) Coating of pesticides on fruits   (B) Rice like stones in rice
    (C) Coating of insecticides on vegetables   (d) Grass in coriander
    Multiple choice questions with one or more than one correct atternative/s

107.
Choose the letter/s that indicate/s the organelle/s that contain/s DNA

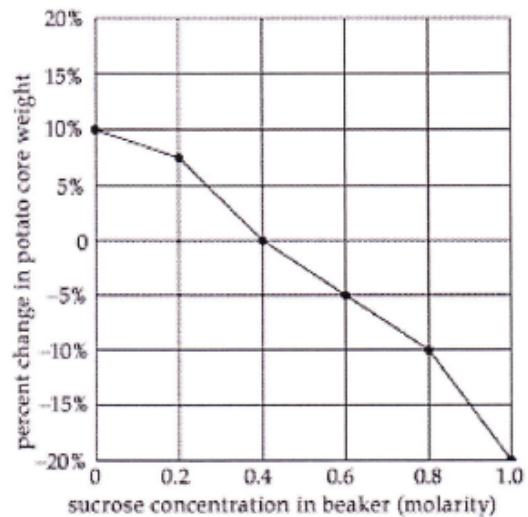(A) a   (B) b   (C) c   (D) d

108. Two pea plants, one with round green seeds (RRyy) and another with wrinkled yellow (rrY\) seeds, when crossed produce Fs progen] that have round yellow (RrYy) seeds. When F1 plants are selfed, the F2 progeny will have new combination of characters. Choose the new combination from the following which isiare not present in the parents and grandparents.
(A) Round, yellow
(B) Round, green
(C) Wrinkled, yellow
(D) Wrinkled, green

109.

A section of fresh potato was added to six beakers. One beaker was filled with distilled water and the remaining five beakers were filled with sucrose solutions of 0.2 M, 0.4 M, 0.6 M, 0.8 M and 1.0 M. The potato sections were removed after 15 minutes and changes in weights of the section were recorded in the graph that follows:

(i) Which of the following is true for the potato sections in the beakers with 0.6 M, 0.8 M and 1.0 M solutions?

(ii) What is the concentration of solutes inside the potato sections?

(A) (i) – The potato core was isotonic compared to the solutions in the beakers; (ii) –0.2 M

(B) (i) – The potato core was hypertonic compared to the solutions in the beakers; (ii) –0.4 M

(C) (i) – The potato core was hypotonic compared to the solutions in the beakers; (ii) –0.4 M

(D) (i) – There is no change in the potato core placed in these solutions; (ii) –0.2 M.

110. A large forest whose soil is rich in nitrogen and phosphorus has been removed by clear-cutting and the land has not been replanted. After two years, it was found that the aquatic organism in the nearby lake have been killed though the whole river has been enriched with the growth of algae. Choose the correct statement/s which best describes reason/s for the death of the aquatic organisms.
(A) Soil erosion led to the mixing of nitrogen and phosphorus in the lake which is used by algae for their
growth.
(B) Air pollutants like CO_2, NO_2 got dissolved in the lake water decreasing the oxygen content of water.
(C) Oxygen is depleted by the growth of the algae leading to the suffocation of aquatic animals resulting
in their death.
(D) Aquatic organisms are killed and consumed by the terrestrial animals.

X--------------------X------------------------X