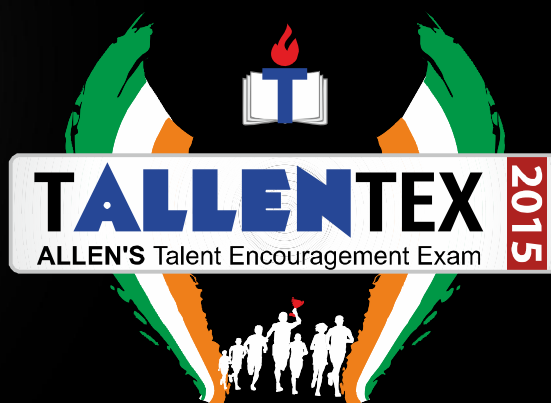


Form No.

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TALLENTEX (Pre) 2015 : (12, October 2014)



CLASS - 10th (X)

Duration : 2 Hrs.

Maximum Marks : 320

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

Things NOT ALLOWED in EXAM HALL : Blank Paper, clipboard, log table, slide rule, calculator, camera, mobile and any electronic or electrical gadget. If you are carrying any of these then keep them at a place specified by invigilator at your own risk.

INSTRUCTIONS

1. This booklet is your Question Paper. **DO NOT** break seal of Booklet until the invigilator instructs to do so.
2. Fill your TALLENTEX Form No. in the space provided on the top of this page.
3. The Answer Sheet is provided to you separately which is a machine readable Optical Response Sheet (ORS). You have to mark your answers in the ORS by darkening bubble, as per your answer choice, by using black ball point pen.
4. Total Questions to be Attempted 80. Part-I : 20 Questions & Part-II : 60 Questions.
5. After breaking the Question Paper seal, check the following:
 - a. There are **20 pages** in the booklet containing question no. 1 to 100 under 2 Parts i.e. Part-I & Part-II.
 - b. Part-I contains total 20 questions of IQ (Mental Ability).
 - c. Part-II contains total 80 questions under 4 sections which are-Section (A) : Physics, Section (B): Chemistry, Section (C): Biology* & Section (D): Mathematics*.

***Important:** You have to attempt ANY ONE SECTION only out of Section(C): Biology and Section (D) : Mathematics.
DO NOT attempt both sections.
6. Marking Scheme:
 - a. If darkened bubble is RIGHT answer : 04 Marks.
 - b. If darkened bubble is WRONG answer: -01 Mark (Minus One Mark).
 - c. If no bubble is darkened in any question: No Mark.
7. Think wisely before darkening bubble as there is negative marking for wrong answer.
8. If you are found involved in cheating or disturbing others then your ORS will be cancelled.
9. Do not put any stain on ORS and hand it over back properly to the invigilator
10. You can take along the question paper after the test is over.

A Specially Designed initiative at National Level to Encourage Young Talent

by



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PART-I

IQ (MENTAL ABILITY)

This section contains **20 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

1. In the following question, a number series is given with one term missing. Choose the correct alternative that will continue the same pattern and replace the question mark in the given series.

9, 27, 31, 155, 161, 1127, ?

- (1) 316 (2) 1135
(3) 1288 (4) 2254

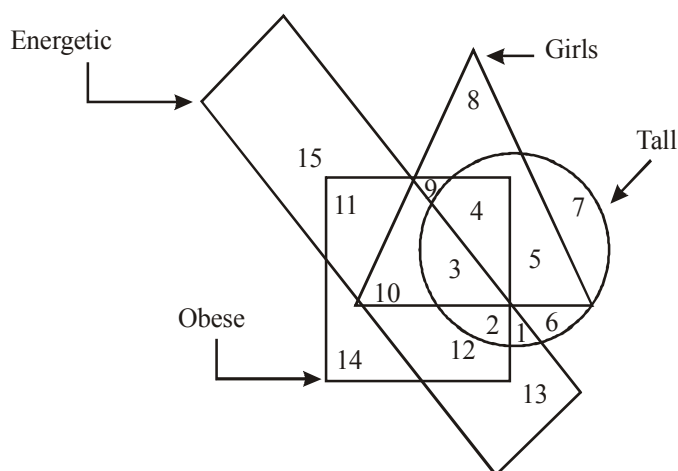
2. A clock is set to show the correct time at 11 a.m. The clock gains 12 minutes in 12 hours. What will be the true time when the clock indicates 1 p.m. on the 6th day?

- (1) 10 a.m. (2) 11 a.m.
(3) 12 noon (4) None of these

3. Which day can be the first day and last day of any century?

- (1) Monday (2) Tuesday
(3) Friday (4) Wednesday

Direction (Q.4 & Q.5) The following questions are based on the diagram given below. In the diagram, circle represents tall children, the square represents obese children, rectangle represents the energetic children and the triangle represents girl children. Study the diagram and answer the questions that follow.



4. Which areas represent energetic children who are not obese ?

- (1) 1, 13 and 15 (2) 13 and 15
(3) 1, 11 and 15 (4) 6, 13 and 15

5. Which of the following areas represent obese and energetic children, who are neither girls nor tall ?
- (1) 2 and 12 (2) 3 and 10
(3) 2 and 3 (4) 11 and 12

Direction (Q.6 & Q.7): P, Q, R, S, T, V and W are travelling in three different vehicles. There are at least two passengers in each vehicle I, II & III and only one of them is a male. There are two engineers, two doctors and three teachers among them.

- (i) R is a lady doctor and she does not travel with the pair of sisters, P and V
(ii) Q, a male engineer, travels with only W, a teacher in vehicle I.
(iii) S is a male doctor.
(iv) Two persons belonging to the same profession do not travel in the same vehicle.
(v) P is not an engineer and travels in vehicle II
6. Which of the following is not correct?
- (1) T-Male Teacher (2) Q-Male Engineer
(3) W-Female Teacher (4) V-Female Teacher
7. How many lady members are there among them?
- (1) Three (2) Four
(3) Three or Four (4) Data inadequate

Direction (Q.8 & Q.9) : In a certain code language if

'pit na sa' means 'you are welcome'

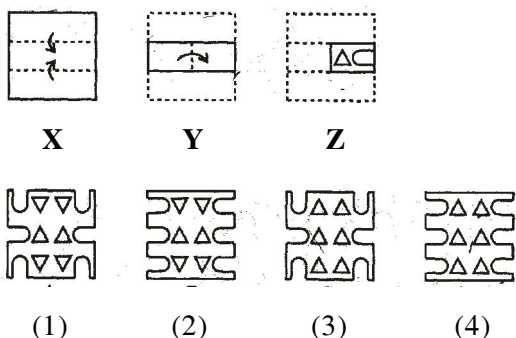
'na ho pa la' means 'They are very good'

'ka da la' means 'who is good'

'od ho pit la' means 'they welcome good people'

8. Which of the following means 'people' in that code language?
- (1) ho (2) pit (3) la (4) od
9. Which of the following means 'very' in that code language?
- (1) na (2) da (3) pa (4) data inadequate
10. A watch, which gains uniformly, is 2 min, slow at noon on Sunday, and is 4 min 48 seconds fast at 2 PM on the following Sunday. When was it correct ?
- (1) 2 : 00 PM on Tuesday (2) 12 Noon on Monday
(3) 2 : 00 AM on Tuesday (4) None of these

11. The following question consists of a set of three figures X, Y and Z showing a sequence of folding of a piece of paper. Fig (Z) shows the manner in which the folded paper has been cut. These three figures are followed by four answer figures from which you have to choose a figure which would most closely resemble the unfolded form of fig. (Z).



12. In a coded language:

$$\bigcirc \times \square = 8, \quad \triangle \times \bigcirc = 10,$$

$$\triangle \times \square = 20, \quad \star \times \triangle = 35,$$

Then $\star = ?$

- (1) 2 (2) 4 (3) 7 (4) 5
13. Pointing out to a lady, a girl said "She is the daughter-in-law of the grand mother of my father's only son" How is the lady related to the girl ?
(1) Sister-in-law (2) Mother (3) Aunt (4) Cousin
14. There are two circular concentric rings, with 26 sectors on each ring marked A to Z. Sectors on outer and inner circles match in a perfect size fit. Whereas the outer ring contains the sectors marked clockwise, the inner ring has sectors marked anticlockwise, such that sectors marked A on both the circles are coinciding at present, B on the outer circle coincides with Z on the inner circle and so on. If the outer circle is rotated clockwise by two sectors from the original position, how many alphabets will coincide on both the circles ?
(1) 1 (2) 2 (3) 3 (4) None of these
15. In a knockout tournament 64 players participated. These 64 players are seeded from 1 to 64 with seed 1 being the top seed and seed 64 being the bottom seed. The tournament is conducted in different stages.

In stage 1, seed 1 played with seed 64 and that match is named as match 1 of stage 1, seed 2 played with seed 63 and that match is named as match 2 of stage 1, and so on.

In stage 2, winner of match 1 and match 32 of stage 1 played against each other and that match is named as match 1 of stage 2, then winner of match 2 and match 31 of stage 1 played against each other and that match is named as match 2 of stage 2. and so on. The same procedure is followed in further stages.

Which lowest seeded player can win the tournament without causing an upset by him ?

- (1) 32 (2) 33 (3) 34 (4) None of these

16. Find the minimum cuts required to divide a cube in 125 cubes ?
 (1) 8 (2) 10 (3) 12 (4) 15
17. Is country X's GDP higher than country Y's GDP ?
 (A) GDP's of the countries X and Y have grown over the past 5 years at compounded annual rate of 5% and 6% respectively.
 (B) 5 years ago, GDP of country X was higher than that of country Y.
 (1) If the question can be answered by one of the statements alone and not by the other.
 (2) If the question can be answered by using either statement alone
 (3) If the question can be answered by using both the statements together, but cannot be answered by using either statements alone.
 (4) If the question cannot be answered even by using both the statements together.
18. Substitute different digits (0, 1, 2.....,9) for different letters in the problem below, so that the corresponding addition is correct and it results in the maximum possible value of MONEY.

		P	A	Y
			M	E
	R	E	A	L
M	O	N	E	Y

The resulting value of 'MONEY' is

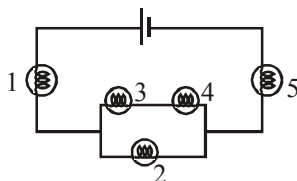
- (1) 10364 (2) 10563 (3) 10978 (4) None of these
19. Following question has a set of four statements. Each statement has three segments. Choose the alternative where the third segment in the statement can be logically deduced using both the preceding two but not just from one of them.
 (A) Dinosaurs are pre-historic creatures. Water-buffaloes are not dinosaurs. Water buffaloes are not pre-historic creatures.
 (B) All politicians are frank. No frank people are crocodiles. No crocodiles are politicians.
 (C) No diamond is quartz. No opal is quartz. Diamonds are opals.
 (D) All monkeys like bananas. Some GI Joes like bananas. Some GI Joes are monkeys.
 (1) C only (2) B only
 (3) A and D (4) B and C
20. Mr. Raghav went in his car to meet his friend John. He drove 30 km towards north and then 40 km towards west. He then turned to south and covered 8 km. Further he turned to east and moved 26 km. Finally he turned right and drove 10 km and then turned left to travel 19 km. How far and in which direction is he from the starting point?
 (1) East of starting point, 5 km
 (2) East of starting point, 13 km
 (3) North-East of starting point, 13 km
 (4) North-East of starting point, 5 km

PART-II

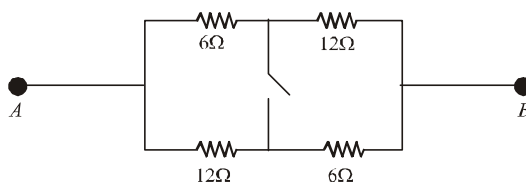
SECTION-A : PHYSICS

This section contains **20 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

21. All the bulbs below are identical. Which bulb(s) light(s) most brightly ?

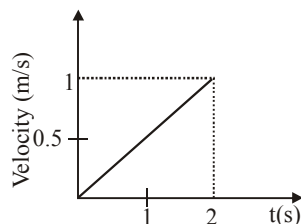


- (1) 1 only (2) 2 only (3) 3 and 4 (4) 1 and 5
22. A piece of copper and another of germanium are cooled from room temperature to 80 K. The resistance of
- (1) Each of them increases
(2) Each of them decreases
(3) Copper increases and that of germanium decreases
(4) Copper decreases and that of germanium increases
23. If other factors remain constant, which of the following combinations of number of turns per 20 cm and electric current respectively in a solenoid produce the weakest electromagnet?
- (1) 500 turns & 3 A (2) 700 turns & 2 A
(3) 200 turns & 5 A (4) 300 turns & 4 A
24. A wire is placed vertically between the poles of a horse-shoe magnet, such that the north pole is to your left and south pole is to your right. It carries a direct current flowing upwards then it will experience a force tending to deflect it
- (1) to your left (2) to your right
(3) away from you (4) towards you
25. The ratio of equivalent resistance across A and B when switch is open to that when switch is closed is

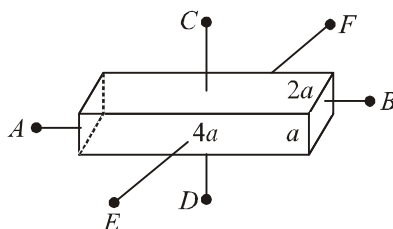


- (1) $\frac{3}{8}$ (2) $\frac{5}{8}$ (3) $\frac{7}{8}$ (4) $\frac{9}{8}$
26. A charged particle moves through a region of magnetic field pointing in the direction perpendicular to its direction of velocity. Then during its subsequent motion,
- (1) Its momentum changes but the kinetic energy remains constant.
(2) Its momentum and kinetic energy both changes.
(3) Its momentum and kinetic energy both remains constant.
(4) Its kinetic energy changes but the momentum remains constant.

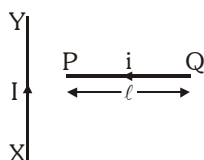
27. A body starts performing uniform circular motion such that it covers 100 rounds per min. Then the minimum time after which its average velocity will be zero is
 (1) 0.5 s (2) 0.6 s (3) 0.7 s (4) 0.8 s
28. For a body of 50 kg mass, the velocity-time graph is shown in figure. Then force acting on the body is



- (1) 25 N (2) 50 N (3) 12.5 N (4) 100 N
29. Superconductors are materials that appear to exhibit no resistance. Therefore, electrons passing through a superconductor will
 (1) generate no current (2) generate no heat
 (3) increase the current's power (4) decrease the electrons' charge
30. A conductor with rectangular cross-section has dimensions ($a \times 2a \times 4a$) as shown in figure. Resistance across AB is x , across CD is y and across EF is z . Then

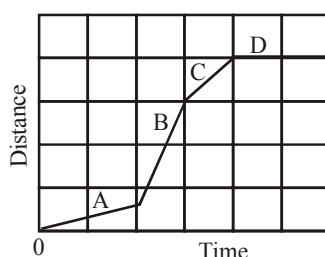


- (1) $x = y = z$ (2) $x > y > z$ (3) $y > z > x$ (4) $x > z > y$
31. Fleming's right hand rule gives
 (1) The magnitude of induced current
 (2) The magnitude of the magnetic field
 (3) The direction of induced current
 (4) Both magnitude and direction of the induced current
32. A wire PQ carrying a current 'i' is placed perpendicular to a long wire XY carrying a current I. The direction of force on PQ will be

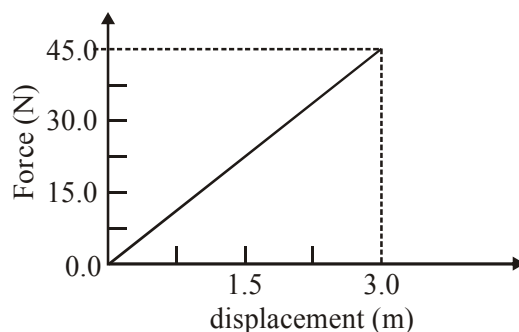


- (1) towards right (2) towards left (3) upwards (4) downwards
33. In SONAR, we use
 (1) ultrasonic waves (2) infrasonic waves (3) radio waves (4) audible sound waves
34. A student is learning how to play a woodwind instrument. Which of the following would LEAST affect the frequency of the sound made by the woodwind?
 (1) the length of the air column (2) the vibration of the mouthpiece
 (3) the air's compressions and rarefactions (4) the amplitude of the sound waves

35. Which of the following statements is incorrect?
- If the velocity of a body changes, it must have some acceleration.
 - If the speed of a body changes, it must have some acceleration.
 - If the body has acceleration, its speed must change.
 - If the body has acceleration, its velocity must change.
36. A ball having a certain mass is moving with a velocity v_0 on a horizontal surface. The ball collides with a stationary ball having four times its mass. The first ball immediately comes to rest after collision then with what velocity will the second ball move? (Assume frictionless surfaces)
- $0.25 v_0$
 - $0.5 v_0$
 - $4 v_0$
 - v_0
37. According to the given graph, the order of the speeds from slowest to fastest is



- D, C, A, B
 - B, C, A, D
 - C, B, A, D
 - D, A, C, B
38. Ananya is travelling to visit her grandmother. First, she travels at an average speed of 12 km/h for 10 km. Then she travels at 8.0 km/h for another 1.25 h. Calculate her average speed for the entire trip to her grandma's house.
- 3.2 km/h
 - 4.4 km/h
 - 9.6 km/h
 - 19.2 km/h
39. A body is dropped from a certain height. When it loses U amount of its energy, it acquires a velocity ' v '. The mass of the body is
- $2U/v^2$
 - $2v/U^2$
 - $2v/U$
 - $U^2/2v$
40. The graph shows the force and displacement of an object that is being pushed. How much power would be developed if the work were done in 2.5 sec. ?



- 3.0 W
- 6.0 W
- 27 W
- 54 W

SECTION-B : CHEMISTRY

This section contains **20 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

41. Pratyush took sulphur powder on a spatula and heated it. He collected the gas evolved by inverting a test tube over the burning sulphur. What will be the action of this gas on dry litmus paper :
- (1) Red litmus paper turns blue. (2) Blue litmus paper turns red.
(3) No action on litmus paper. (4) Both 1 and 2
42. A volatile liquid has :
- (1) low boiling point and weaker interparticle forces
(2) high boiling point and weaker interparticle forces.
(3) high boiling point and stronger interparticle forces
(4) low boiling point and stronger interparticle forces.
43. Which of these is a solution ?
- (1) 14 Carat Gold (2) Salted water
(3) Carbonated water (4) All of these
44. When sodium bisulphite reacts with hydrochloric acid, the products formed are :
- (1) NaCl, H₂O and SO₂ (2) Na₂SO₄ and NaCl
(3) NaCl and H₂S (4) No reaction takes place
45. When ferric chloride reacts with aq. NaOH, a coloured ppt is formed, whose chemical formula is :
- (1) Brown, Fe(OH)₂ (2) Green, Fe(OH)₂
(3) Green, Fe(OH)₃ (4) Brown, Fe(OH)₃
46. 8 gm NaOH is dissolved in one litre of solution, it's molarity is
(atomic mass of Na = 23, O = 16, H = 1)
- (1) 0.8 M (2) 0.4 M (3) 0.2 M (4) 0.1 M
47. The process in which a hydrated salt loses its water of crystallisation to the air is called :
- (1) Vaporisation (2) Deliquescence
(3) Efflorescence (4) Sublimation
48. Number of molecules in 500 ml of each H₂, O₂ and CO₂ at STP are in the order
- (1) H₂ < O₂ < CO₂ (2) H₂ > O₂ > CO₂
(3) H₂ = O₂ = CO₂ (4) H₂ > O₂ ≠ CO₂
49. Which among the following statements about the reaction given below are **CORRECT**?
- $\text{MnO}_2 + 4 \text{HCl} \rightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$
- (I) Manganese oxide is oxidised
(II) Hydrogen Chloride is reduced
(III) Manganese oxide is oxidising agent
(IV) Hydrogen Chloride is reducing agent
- (1) I and II (2) III and IV (3) II and IV (4) I, II, III and IV

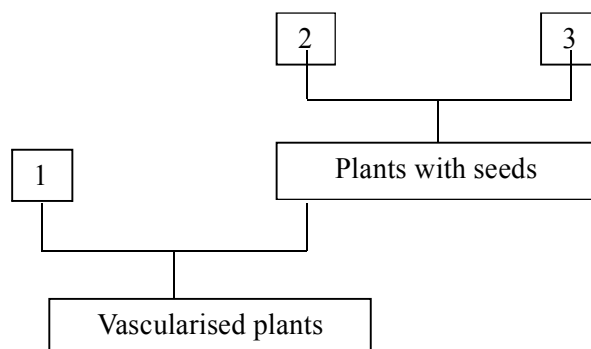
50. Which of the following statements is **INCORRECT** ?
- (1) The conjugate base of H_2PO_4^- is HPO_4^{2-} .
 - (2) The pH of 1 M HCl is 0.
 - (3) H_3PO_3 is a tribasic acid.
 - (4) The concentration of H^+ ions in pure water is $10^{-7} \text{ mol L}^{-1}$ at 298 K.
51. Which of the following has arranged in order of increasing oxidation numbers of nitrogen?
- (1) $\text{NH}_3 < \text{N}_2\text{O}_5 < \text{NO} < \text{N}_2$
 - (2) $\text{NO}_2^+ < \text{NO}_3^- < \text{NO}_2^- < \text{N}_3^-$
 - (3) $\text{NH}_4^+ < \text{N}_2\text{H}_4 < \text{NH}_2\text{OH} < \text{N}_2\text{O}$
 - (4) $\text{NO}_2 < \text{NaN}_3 < \text{NH}_4^+ < \text{N}_2\text{O}$
52. Which among the following statements is **INCORRECT** for magnesium metal?
- (1) It burns in oxygen with a dazzling white flame.
 - (2) It reacts with cold water to form magnesium oxide and evolves hydrogen gas.
 - (3) It reacts with hot water to form magnesium hydroxide and evolves hydrogen gas.
 - (4) It reacts with steam to form magnesium oxide and evolves hydrogen gas.
53. For a reaction $\text{A} + 2 \text{B} \rightarrow \text{C}$, the amount of C formed by starting the reaction with 5 moles of A and 8 moles of B is
- (1) 5 moles
 - (2) 8 moles
 - (3) 16 moles
 - (4) 4 moles
54. Which of the following metals are refined by electrolytic refining?
- (i) Au
 - (ii) Cu
 - (iii) Zn
 - (iv) K
- (1) (i) and (ii)
 - (2) (ii) and (iii)
 - (3) (i), (ii), (iii)
 - (4) (ii), (iii) and (iv)
55. How many moles of ferric alum $(\text{NH}_4)_2\text{SO}_4 \cdot \text{Fe}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$ can be made from the sample of Fe containing 0.0056 g of it ? [Atomic mass of Fe = 56 u]
- (1) 10^{-4} mol
 - (2) $0.5 \times 10^{-4} \text{ mol}$
 - (3) $0.33 \times 10^{-4} \text{ mol}$
 - (4) $2 \times 10^{-4} \text{ mol}$
56. How many moles of O_2 will be liberated by one mole of CrO_5 in the following reaction?
- $$\text{CrO}_5 + \text{H}_2\text{SO}_4 \longrightarrow \text{Cr}_2(\text{SO}_4)_3 + \text{H}_2\text{O} + \text{O}_2$$
- (1) 4.5
 - (2) 2.5
 - (3) 1.25
 - (4) None of these
57. If your teeth start decaying, the dentist may advise you to have your teeth filled. Which of the following is not used as the dental filling ?
- (1) Gold
 - (2) Sorel's cement
 - (3) Zinc oxychloride
 - (4) Zinc
58. Bleaching powder has several uses, some of which are mentioned here. Pick the **false** one ?
- (1) For decolourising sugar
 - (2) For bleaching paper pulp
 - (3) For sterilizing water
 - (4) For making chloroform
59. 5.85 g of NaCl was treated with concentrated H_2SO_4 and the gas evolved was passed into a solution of silver nitrate. The white precipitate obtained was filtered, dried and weighed. Assuming complete reaction, how many grams of precipitate was obtained ? [Atomic mass of Ag = 108 u, Na = 23 u & Cl = 35.5 u]
- (1) 10.8g
 - (2) 14.35g
 - (3) 35.5g
 - (4) 3.65g
60. A 10^{-6} M HCl solution is diluted to 100 times. The pH of the diluted solution would be
- (1) between 6 to 7
 - (2) between 7 to 8
 - (3) equal to 7
 - (4) equal to 10

Attempt any one of the section C or D

SECTION-C : BIOLOGY

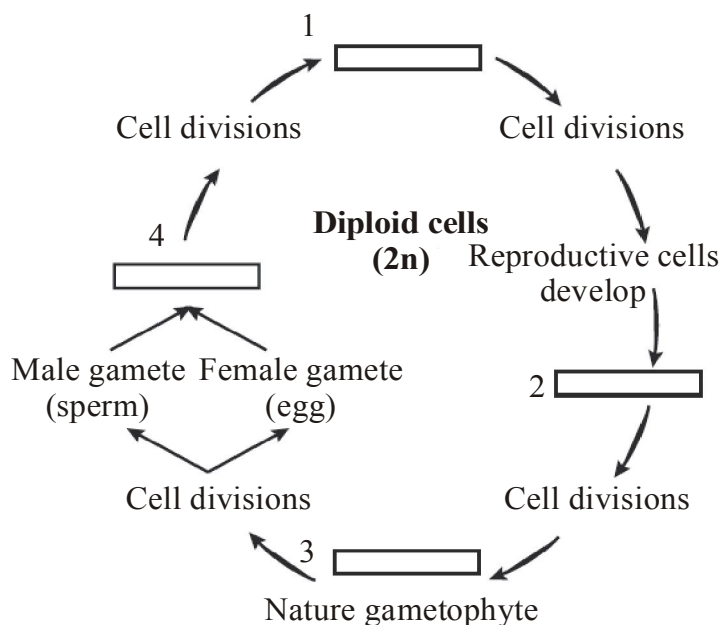
This section contains **20 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

61. Which one of the following statement is incorrect?
 - (1) Glucagon is secreted by pancreas
 - (2) Androgen is produced by ovary
 - (3) Thyroxine is secreted by thyroid
 - (4) Oxytocin is released by pituitary
62. The type of tissue that forms the framework of the external ear is
 - (1) Epithelial tissue
 - (2) Connective tissue
 - (3) Nervous tissue
 - (4) Muscular tissue
63. Which of the following strategies is not the correct approach to reduce the global warming?
 - (1) Cutting down use of fossil fuel
 - (2) Improving efficiency of energy usage
 - (3) Reducing deforestation
 - (4) Cutting trees and increasing growth of human population
64. The sequence of events by which a cell duplicates its genome, synthesizes the other constituents of the cell and eventually divides into two daughter cells is termed as
 - (1) Cell duplication
 - (2) Cell cycle
 - (3) Cell growth
 - (4) Regeneration
65. Which component of gastric juice inactivates salivary amylase ?
 - (1) Mucus
 - (2) Rennin
 - (3) HCl
 - (4) Pepsin
66. Choose the odd pair out .
 - (1) Areolar connective tissue – Collagen
 - (2) Epithelium – Keratin
 - (3) Neuron – Melanin
 - (4) Muscle fibre – Actin
67. Photosynthesis is a
 - (1) Physico-chemical process
 - (2) Physical process
 - (3) Chemical process
 - (4) Catabolic process
68. Study the chart. What do the numbered boxes indicate?



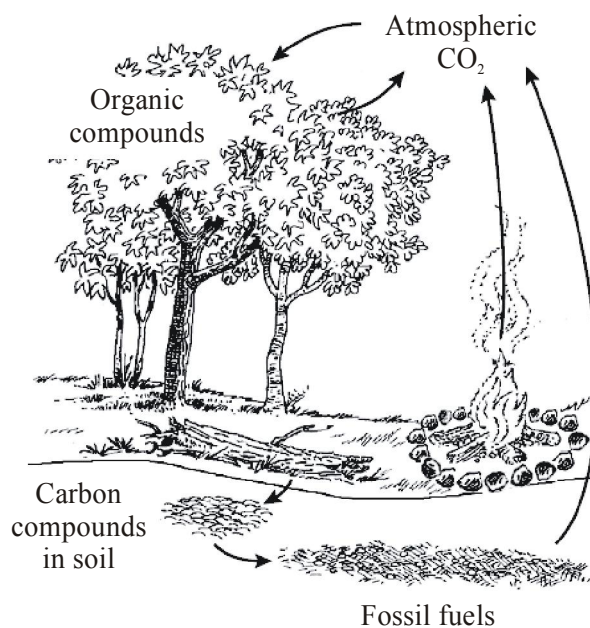
- (1) 1 - Bryophytes, 2 - Pteridophytes, 3 - Gymnosperm
- (2) 1 - Pteridophytes, 2 - Bryophytes, 3 - Gymnosperm
- (3) 1 - Pteridophytes, 2 - Gymnosperm, 3 - Angiosperm
- (4) 1 - Gymnosperm, 2 - Angiosperm, 3 - Pteridophytes

69. Among mammals, which one plays a significant role in the digestion of milk proteins?
- (1) Pepsin (2) Rennin
(3) Trypsin (4) Amylase
70. Match Column - I with Column - II and select the correct option.
- (A) Plantae 1. Archaeobacteria
(B) Fungi 2. Euglenoids
(C) Protista 3. Phycomycetes
(D) Monera 4. Bryophyta
- (1) A - 4, B - 3, C - 2, D - 1 (2) A - 1, B - 2, C - 3, D - 4
(3) A - 3, B - 4, C - 2, D - 1 (4) A - 4, B - 2, C - 3, D - 1
71. The term 'water-pollution' can be defined in several ways. Which of the following statements does not give the correct definition ?
- (1) The addition of undesirable substances in water bodies.
(2) The removal of desirable substances from water bodies.
(3) A change in pressure of the water bodies.
(4) A change in temperature of the water bodies.
72. Identify the missing labels in the diagram below.



- (1) 1-meiosis forms spores; 2-zygote forms; 3-diploid; 4-sporophyte
(2) 1-sporophyte; 2-meiosis forms spores; 3-haploid; 4-zygote forms
(3) 1-sporophyte; 2-meiosis forms spores; 3-diploid; 4-zygote forms
(4) 1-zygote forms; 2-sporophyte; 3-diploid; 4-meiosis forms spores

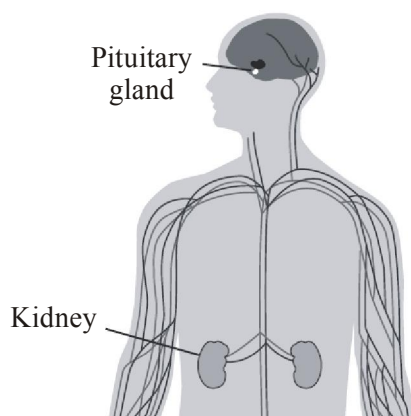
73. The diagram below shows part of the carbon cycle.



If many trees are removed from a forest by logging, what is the most immediate effect on the carbon cycle in that forest?

- (1) Increased rates of decomposition
- (2) Decreased use of atmospheric CO₂
- (3) Decreased combustion of fossil fuels
- (4) Increased production of organic compounds

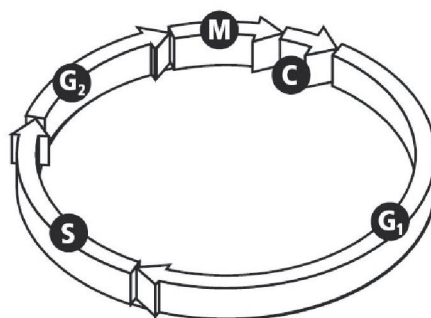
74. The diagram below shows the locations of the pituitary gland and the kidneys in the human body.



The pituitary gland can release a substance into the bloodstream that signals target cells in the kidneys to reabsorb more water. The released substance is an example of

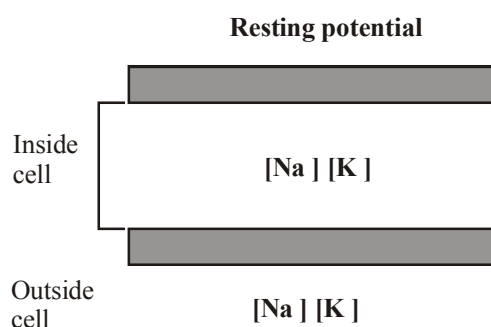
- (1) An enzyme
- (2) A hormone
- (3) A neurotransmitter
- (4) A vitamin

75. During which stage of the cell cycle does the cell duplicate its DNA?



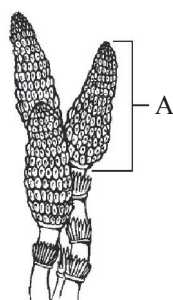
- (1) M stage (2) G_1 stage (3) S stage (4) G_2 stage

76. Predict what will happen as an impulse travels along the axon in the diagram below.



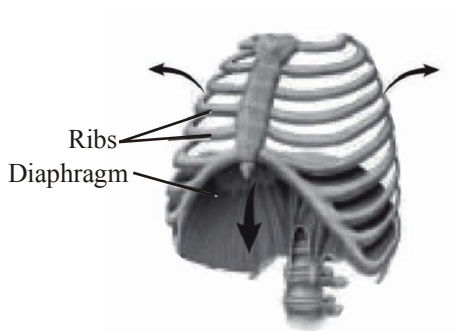
- (1) More potassium will move into the cell.
(2) More sodium will move into the cell.
(3) Both sodium and potassium will move out of the cell.
(4) Sodium will move out of the cell.

77. What is produced by the structure labelled A in the illustration?



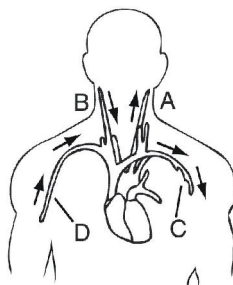
- (1) Rhizoids (2) Thallose leaves
(3) Spores (4) Rhizomes

78. Which process is taking place in this diagram?



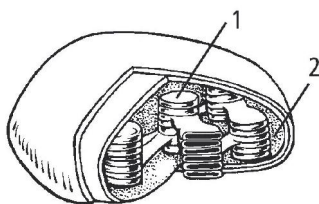
- (1) Inhalation; the diaphragm is contracting.
- (2) Exhalation; the diaphragm is relaxing.
- (3) Inhalation; the chest cavity is reduced.
- (4) Exhalation; the rib cage is expanding.

79. Two arteries and two veins are labelled in the diagram. Which two are veins?



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

80. Which reaction takes place in the stroma (2) of the chloroplast?



- (1) Glycolysis
- (2) Light-dependent reaction
- (3) Light-independent reaction
- (4) Krebs cycle

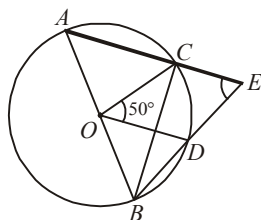
SECTION-D : MATHEMATICS

This section contains **20 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

81. a, b, c are three real numbers such that $a + b + c = 7$, $a^2 + b^2 + c^2 = 35$ and $a^3 + b^3 + c^3 = 151$. Find the value of abc .

- (1) 12 (2) 14
(3) -15 (4) -13

82. In the given figure, O is the centre and AB is a diameter of the circle. AC and BD when produced, meet at E . If $\angle COD = 50^\circ$, then $\angle CED =$ _____?



- (1) 100° (2) 65°
(3) 130° (4) None of these

83. If $A + B = 225^\circ$, then the value of $(1 + \tan A)(1 + \tan B)$ is

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

84. Value of $(a - c)[(a - b)^2 + (b - c)^2 - (a - b)(b - c)] + (c - a)^3$ is equal to

- (1) $3(a - b)(b - c)(c - a)$ (2) $(a - b)(b - c)(c - a)$
(3) $(a - b)^3(b - c)^3(c - a)^3$ (4) None of these

85. The value of m if $2x^m + x^3 - 3x^2 - 26$ leaves a remainder of 226 when it is divided by $x - 2$.

- (1) 0 (2) 7
(3) 10 (4) All of these

86. If 20 men take 30 days to complete a job, in how many days can 25 men complete the job?

- (1) 23 (2) 24
(3) 25 (4) 26

87. The remainder when x^{1999} is divided by $x^2 - 1$ is

- (1) $-x$ (2) $3x$
(3) x (4) None of these

88. If $\tan \theta = -\frac{1}{\sqrt{5}}$ and θ lies in the II quadrant, then the value of $\cos \theta$ is

(1) $\frac{\sqrt{5}}{\sqrt{6}}$

(2) $\frac{-\sqrt{5}}{\sqrt{6}}$

(3) $\frac{-1}{\sqrt{6}}$

(4) Both (1) and (2)

89. If $\sqrt{a} = \sqrt{b} + \sqrt{c}$ and \sqrt{a}, \sqrt{b} and \sqrt{c} are three surds, then

(1) \sqrt{a} is dissimilar to \sqrt{b} and \sqrt{c}

(2) \sqrt{b} and \sqrt{c} are similar to \sqrt{a}

(3) Only \sqrt{b} is similar to \sqrt{a}

(4) None of these

90. The leading coefficient of a polynomial $P(x)$ of degree 3 is 2006. Suppose that $P(1) = 5$, $P(2) = 7$ and $P(3) = 9$, then find $P(x)$.

(1) $2006(x-1)(x-2)(x-3) + 2x + 3$

(2) $2006(x-1)(x-2)(x-3) + 2x + 1$

(3) $2006(x-1)(x-2)(x-3) + 2x - 1$

(4) $2006(x-2)(x-3)(x-1) - (2x - 3)$

91. " $y_0 y_0$ " is a 3-digit number. If number formed by reversing the digits of " $y_0 y_0$ " is 891 less than " $y_0 y_0$ " number, find its unit digit.

(1) 0

(2) 1

(3) 2

(4) Can't be determined

92. If the difference between the roots of the equation $x^2 + px + 8 = 0$ is 2, then $p =$

(1) ± 2

(2) ± 4

(3) ± 6

(4) ± 8

93. The HCF of two numbers, obtained in three steps of division, is 7 and the first 3 quotients are 2, 4 and 6 respectively. Find the numbers.

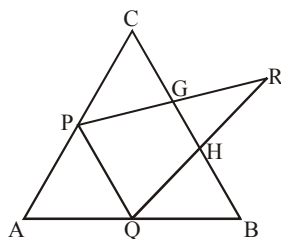
(1) 175, 392

(2) 189, 392

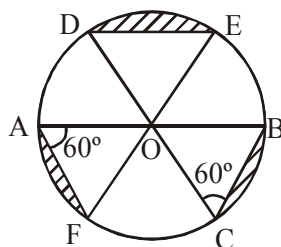
(3) 168, 385

(4) None of these

94. Let α and β be the roots of the equation $(x-a)(x-b) = c$, $c \neq 0$, then the roots of the equation $(x-\alpha)(x-\beta) + c = 0$ are
 (1) a, c (2) b, c
 (3) a, b (4) $a+c, b+c$
95. p is a prime number and $(p^2 + 3)$ is also a prime number. The number of numbers that p can assume is
 (1) 3 (2) 2 (3) 1 (4) can't say
96. If $f(x) = \cos^2 x + \sec^2 x$, its value always is
 (1) $f(x) < 1$ (2) $f(x) = 1$
 (3) $2 > f(x) > 1$ (4) $f(x) \geq 2$
97. In the given figure, P and Q are the mid-points of AC and AB . Also $PG = GR$ and $HQ = HR$. What is the ratio of area of ΔPQR to area of ΔABC ?



- (1) $\frac{1}{2}$ (2) $\frac{2}{3}$ (3) $\frac{3}{5}$ (4) None of these
98. In the adjoining figure O is the centre of the circle with radius r . AB , CD and EF are the diameters of the circle. $\angle OAF = \angle OCB = 60^\circ$. What is the area of the shaded region ?



- (1) $\frac{r^2}{2} \left(\pi - \frac{3\sqrt{3}}{2} \right)$ (2) $\frac{r^2}{2} \left(\pi - \frac{3\sqrt{3}}{4} \right)$
 (3) $\frac{r^2}{3} \left(\pi - \frac{2\sqrt{3}}{3} \right)$ (4) data insufficient

99. The volume of a cylinder is 48.125 cm^3 , which is formed by rolling a rectangular paper sheet along the length of the paper whose length and breadth both have integral values. If a cuboidal box (without any lid i.e., open at the top) is made from the same sheet of paper by cutting out the square of side 0.5 cm from each of the four corners of the paper sheet, then what is the volume of this box ?
- (1) 20 cm^3 (2) 38 cm^3
(3) 19 cm^3 (4) none of these
100. A balloon of radius r subtends an angle α at the eye of an observer and the elevation of the centre of the balloon from the eye is β , then the height h of the centre of the balloon is given by
- (1) $\frac{r \sin \beta}{\sin \alpha}$ (2) $r \sin \beta \sin \alpha$
(3) $\frac{r \sin \beta}{\sin(\alpha/2)}$ (4) $\frac{r \sin \alpha}{\sin(\beta/2)}$

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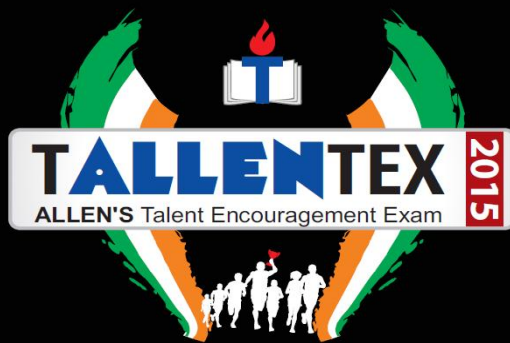
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ANSWER KEY : CLASS - 10th (X)

(Held on : 12-10-2014)

Q. No.	Ans.
1	2
2	2
3	1
4	1
5	4
6	4
7	2
8	4
9	3
10	1
11	2
12	3
13	2
14	2
15	1
16	3
17	4
18	4
19	2
20	3
21	4
22	4
23	3
24	3
25	4

Q. No.	Ans.
26	1
27	2
28	1
29	2
30	4
31	3
32	4
33	1
34	4
35	3
36	1
37	4
38	3
39	1
40	3
41	3
42	1
43	4
44	1
45	4
46	3
47	3
48	3
49	2
50	3

Q. No.	Ans.
51	3
52	2
53	4
54	3
55	2
56	4
57	4
58	1
59	2
60	1
61	2
62	2
63	4
64	2
65	3
66	3
67	1
68	3
69	2
70	1
71	3
72	2
73	2
74	2
75	3

Q. No.	Ans.
76	2
77	3
78	1
79	3
80	3
81	3
82	2
83	3
84	1
85	2
86	2
87	3
88	2
89	2
90	1
91	1
92	3
93	1
94	3
95	3
96	4
97	1
98	1
99	1
100	3