**A Specially Designed Initiative** to Encourage Young Talent by



**TALLENTEX 2018 : (15, October 2017)** PAPER CODE



and the Maria



# **GLASS - 11<sup>th</sup> (X** Duration: 2 Hrs. | Maximum Marks: 320

Answer Sheet No.

Tallentex Roll No.

6

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 responsibility.

# **INSTRUCTIONS**

- This Booklet is your Question Paper. DO NOT break seal of Booklet until the invigilator instructs to do so. 1.
- Fill your TALLENTEX Roll No. & Answer Sheet No. in the space provided on the cover page. 2.
- Carefully fill your **PAPER CODE** and present **CLASS** in space provided (Serial No. 6 & 12) of optical response sheet. 3.
- Please make sure that paper you received is of your class only. 4.

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- Please make sure that the Paper Code Printed on the Test Booklet Cover Page and Inner Pages are the same. In case of 5. discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of Test Booklet.
- The Answer Sheet is provided to you separately which is a machine readable Optical Response Sheet (ORS). You have to mark your 6 answers in the ORS by darkening bubble, as peryour answer choice, by using black or blue ball point pen.
- After breaking the Question Paper seal, check there are 16 pages in the booklet. This Question Paper contains 80 MCQs with 4 7. choices (Subjects: Mental ability: 1-20, Physics: 21-40, Chemistry: 41-60, Biology: 61-80 / Maths: 61-80)
  - Important: Attempt Only One Subject from Biology / Mathematics.
- 8. Think wisely before darkening bubble as there is negative marking for wrong answer. Answer once marked by pen cannot be cancelled.
- 9. Marking Scheme:
  - a. If darkened bubble is RIGHT answer: 4 Marks.
  - b. If darkened bubble is WRONG answer: -1 Mark (Minus One Mark).
  - c. If no bubble is darkened in any question: No Mark.
- 10. If you are found involved in cheating or disturbing others, then your ORS will be cancelled.
- 11. Do not put any stain on ORS and hand it over back properly to the invigilator.
- 12. You can take along the guestion paper after the test is over.

\* Fill appropriate circle of subject in column no. 12 of ORS, otherwise your ORS will be treated as invalid.

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## **SECTION-A : 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. A party consists of grandmother, father, mother, four sons and their wives and one son and two daughters of each of the sons. How many females are there in all? (1) 14(2) 16(3) 18 (4) 24Direction : Read the following information carefully to answer the question given below it : 2. (i) 'A + B' means that A is the father of B. (ii) 'A - B' means that A is the wife of B. (iii)  $'A \times B'$  means that A is the brother of B. (iv)  $A \div B'$  means that A is the daughter of B. If it is given  $P \div R + S + Q$ , which of the following is true ? (1) P is the daughter of Q (2) Q is the aunt of P (4) P is the mother of R (3) P is the aunt of Q 3. A man walks 30 m towards South. Then turning to his right he walks 30 m. Then turning to his left he walks 20 m. Again turning to his left he walks 30 m. How far is he from his starting position ? (1) 30 m (2) 20 m (3) 80 m (4) None of these 4. In a certain code if RAT = 75, CAT = 45, then MAT = ?(1) 55(2) 65 (3) 75 (4) 85 Direction : In the following question, three Statements I, II and III are given. You are required to find 5. out which of the given statement (s) is/are sufficient to answer the question. Mark your answer accordingly. On which day Suresh went to Chennai, if week starts on Monday? (I) Suresh took leave on Wednesday. (II) Suresh went to Chennai the next day of the day his mother came to his house. (III) Suresh's mother came to his house neither on Monday nor Friday. (1) II and III (2) I and II (3) I and III (4) Even I, II and III together are not sufficient 6. Find the missing term in the following series : 46, 94, 285, 1430, \_\_\_\_\_, 110198 (1) 10017(2) 8585 (3) 12879 (4) 10010 7. A clock is set right at 8 a.m. The clock gains 10 minutes in 24 hours. What will be the true time when the clock indicates 1 p.m. on the following day? (2) 46 min. past 12. (3) 45 min. past 12. (1) 48 min. past 12. (4) 47 min. past 12. How many times do the hands of a clock coincides between 10:00 AM to 6:00 PM on the same day? 8. (1) 6(3) 8(2) 7(4) 9Keshev was born on 3<sup>rd</sup> April 1991. How many birth days will he celebrate on Sunday till his 52<sup>nd</sup> 9. birthday? (1) 5(2) 7(3) 6 (4) 8

## CLASS-XI / Paper Code - A

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- 10. **Direction :** Some equal cubes are arranged in the form of a solid block as shown in the adjoining figure. All the visible surfaces of the block (except bottom) are then painted.



How many cubes do not have any of the faces painted? (4) 40(1) 27(2) 32 (3) 36

- 11. A dice is numbered from 1 to 6 in different ways. If 1 is adjacent to 2, 4 and 6, then which of the following statements is necessarily true?
  - (1) 2 is opposite to 6(2) 1 is adjacent to 3
  - (3) 3 is adjacent to 5 (4) 3 is opposite to 5
- 12. Two positions of a dice are given below. When 1 is at the top, which number will be at the bottom ?



13. faces. It is then cut into cubical blocks of each side 2 cm.

How many cubes have three faces painted ?

(1) 0(3) 6(2) 4 (4) 8

14. Choose the correct water image of the given group of letters A1M3b.

(1) AIM3b (5) AIM3b (3) A1M3b (4) AIMEb

15. Three ants are sitting at the three corners of an equilateral triangle. Each ant starts randomly picks a direction and starts to move along the edge of the triangle. Then the probability that none of the ants collide is equal to

$$(1) (1/3) (2) (1/2) (3) (1/8) (4) (1/4)$$

16. If FRIEND is coded as HUMJTK, how is CANDLE written in that code ?

- (1) EDRIRL (2) DCQHQK (3) ESJFME (4) DEQJQM
- 17. Direction : In the following question, find the number of triangles in the given figure.



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Take the given statements as true and decide which of the conclusions logically follow from the statements 18. Statement : (i) All buildings are chalk. (ii) No chalk is toffee.

#### **Conclusion** :

- (i) No building is toffee.
- (ii) All chalks are building.
- (1) Only (i) conclusion follows
- (3) Either (i) or (ii) follows

- (2) Only (ii) conclusion follows
- (4) Neither (i) or (ii) follows

19. Take the given statements as true and decide which of the conclusions logically follow from the statements.

#### **Statements :**

- (i) All papers are books.
- (ii) All bags are books.
- (iii) Some purses are bags.

#### **Conclusions :**

- (I) Some papers are bags.
- (II) Some books are papers.
- (III) Some books are purses.
- (1) Only (I) follows
- (3) Only (I) and (III) follow

- (2) Only (II) and (III) follow
- (4) Only (I) and (II) follow
- 20. If Atul finds that he is twelfth from the right in a line of boys and fourth from the left, how many boys should be added to the line such that there are 28 boys in the line :
  - (1) 12(2) 13 (3) 14 (4) 20

# **SECTION-B** : 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. The angular elevation of an enemy's position on a hill of height h is  $\theta$ . What should be the minimum speed of the projectile in order to shell the enemy ?

(1) 
$$u = \sqrt{gh(\cos e c \theta + 1)}$$
 (2)

 $u = \sqrt{gh \sin \theta}$ 

- (3)  $u = \sqrt{2gh}$
- 22. A small block of mass m is pushed towards a movable wedge of mass  $\eta m$  and height h with initial velocity u. All surfaces are smooth. The minimum value of u for which the block will reach the top of the wedge (No energy is lost in riding over wedge at the bottom of the wedge)



23. If the adjacent sides of a parallelogram are  $\vec{A} = 4\hat{i} + 2\hat{j} - 3\hat{k}$  and  $\vec{B} = 6\hat{k}$ , then the area of the parallelogram is:

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- (1) 12 (2) 5 (3)  $12\sqrt{5}$  (4) 6
- 24. Horizontal square shaped platform of side 10 m on the ground has initially sides coinciding with x-axis and y-axis as shown. A platform starts moving along x-axis with a velocity 10 m/s. A person standing on the platform starts moving on platform towards diagonally opposite corner as shown, with a velocity  $5\sqrt{2}$  m/s. A stationary person standing at origin (Not on the platform) throws a ball in air so that the ball hits the person on platform when it is exactly at center of the platform. Find the velocity of the ball
  - (1)  $5\sqrt{11}$  m/s (2)  $5\sqrt{5}$  m/s (3) 5 m/s (4)  $5\sqrt{10}$  m/s (4)  $5\sqrt{10}$  m/s
- 25. Find the co-ordinates of centre of mass of system of sphere and hollow cone.
  - (1)  $\left(\frac{5}{2}, 0\right)$ (2)  $\left(0, \frac{5}{2}\right)$ (3)  $\left(\frac{3}{2}, 0\right)$ (4)  $\left(0, \frac{3}{2}\right)$
- 26. A block of mass m starts at rest at height h on a frictionless inclined plane. The block slides down the plane, travels a total distance d across a rough horizontal surface with coefficient of kinetic friction  $\mu$  and compresses a spring with force constant k a distance x before momentarily coming to rest. Then the spring extends and the block travels back across the rough surface, sliding up the plane. The correct expression for the maximum height h' that the block reaches on its return is:





 $(4) 53^{\circ}$ 

27. A ball of mass m = 1 kg is hung vertically by a thread of length l = 1.50 metre. Upper end of the thread is attached to the ceiling of a trolley of mass M = 4 kg. Initially, trolley is stationary and it is free to move along horizontal rails without friction. A shell of mass m = 1 kg, moving horizontally with velocity  $v_0 = 6$  m/s, collides with the ball and gets stuck with it. As a result, thread starts to deflect towards right. The maximum inclination of thread with the vertical is  $(g = 10 \text{ m/s}^2)$ 



(1) 30°

30.

 $(2) 37^{\circ}$ 

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**28.** Particle 'A' moves with speed 10 m/s in a frictionless circular fixed horizontal pipe of radius 5 m and strikes with 'B' of double mass that of A. Coefficient of restitution is 1/2 and particle 'A' starts its journey at t = 0. The time at which second collision occurs is :



**29.** Maximum acceleration of block A after its collision with block B has magnitude (Assume the collision to be elastic. Before collision block A was at rest and spring was relaxed.)



**31.** A block of mass 5 kg is pulled vertically upwards with constant acceleration 5 ms<sup>-2</sup>. Upward pulling force is equal to-

(1) 25 N	(2) 50 N
(3) 75 N	(4) 125 N

**32.** As shown, a big box of mass M is resting on a horizontal smooth floor. On the bottom of the box there is a small block of mass m. The block is given an initial speed  $v_0$  relative to the floor, and starts to bounce back and forth between the two walls of the box. Find the final speed of the box when the block has finally come to rest in the box.

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**33.** A projectile is launched from a cliff of height h = 10 m above the ground at an angle  $\theta$  above the horizontal. After a time  $t_1 = 1$  sec has elapsed since the launch, the projectile passes the level of the cliff top moving downward. It eventually lands on the ground at horizontal distance d = 10 m from its launch site. The value of tan  $\theta$  is  $(g = 10 \text{m/s}^2)$ 



	(1) 2	(2) 0.8	(3) 1.4	(4) None	of these
34.	A car of mass 15	500 kg is moving with v	elocity 36 kmh <sup>-1</sup> . A tr	ruck of mass 5000 l	kg is moving with
	velocity 54 kmh <sup>-</sup>	<sup>-1</sup> and acceleration 0.2 n	ns <sup>-2</sup> . Magnitude of pse	eudo force on the c	ar w.r.t the driver

- (3) 750 N (4) 15000 N
- **35.** An object of mass m is attached to a spring. The restoring force of the spring is  $F = -\lambda x^3$ , where x is the displacement. The oscillation period depends on the mass,  $\lambda$  and oscillation amplitude. Suppose the object is initially at rest. If the initial displacement is D then its period is  $\tau$ . If the initial displacement is 2D, find the period. (Hint: Use dimension analysis.)

- (3)  $\tau$  (4)  $\tau/2$
- **36.** A particle is thrown upwards from ground. It experiences a constant resistance force which can produce retardation 2 m/s<sup>2</sup>. The ratio of time of ascent to the time of descent is :  $[g = 10 \text{ m/s}^2]$

(1) 1 : 1 (2) 
$$\sqrt{\frac{2}{3}}$$

(3) 
$$\frac{2}{3}$$
 (4)  $\sqrt{\frac{3}{2}}$ 

**37.** Experimentally it has been found that the force F needed to compress elastically a ball through a distance x (as shown in the figure) follows the formula  $F(x) = ax + bx^2 + cx^3$  where a, b and c are constants. The small ball of mass m at rest is dropped from a great height h. It bounces elastically off the floor and is compressed a maximum distance 'd' during the bounce. The height h is :- (where 'g' is the acceleration due to gravity)



(1)  $\frac{1}{mg} \left( \frac{1}{2} ad^2 + \frac{1}{3} bd^3 + \frac{1}{4} cd^4 \right)$ (2)  $\frac{1}{mg} \left( ad + bd^2 + cd^3 \right)$ (3)  $\frac{1}{mg} \left( ad^2 + bd^3 + cd^4 \right)$ (4)  $\frac{1}{mg} \left( ad^2 + 2bd^3 + 3cd^4 \right)$ 

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**38.** A particle is projected with a speed  $10\sqrt{2}$  m/s and at angle 45° with the horizontal. The rate of change of speed with respect to time at t = 1s is (g = 10 m/s<sup>2</sup>)

(1) 
$$\frac{10}{\sqrt{2}}$$
 m/s<sup>2</sup> (2) 10 m/s<sup>2</sup> (3) zero (4) 5 m/s<sup>2</sup>

**39.** A fixed wedge ABC is in the shape of an equilateral triangle of side  $\ell$ . Initially, a chain of length  $2\ell$  and mass m rests on the wedge inside of a tube as shown. The chain is pulled slightly, as a result it starts sliding out of the tube from end C. Work done by gravity till the time, the chain leaves the wedge will be :-



**40.** Three blocks A, B and C of equal mass m are placed one over other on a frictionless surface (table) as shown in the figure. Coefficient of friction between any blocks A, B and C is  $\mu$ . The maximum value of mass of block M<sub>D</sub> so that the block A, B and C move without slipping over each other is



#### **SECTION-C : 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.** The approximate size of the nucleus of  $^{64}_{28}N_i$  is :
  - (1) 3 fm (2) 4 fm (3) 5 fm (4) 2 fm
- **42.** 5 moles of A, 6 moles of Z and mixed with sufficient amount of C to produce final product F. How many maximum moles of 'F' can be produced as per the given sequence of reaction

$$A + 2Z \rightarrow B$$
;  $B + C \rightarrow Z + F$ 

(1) 3 (2) 2 (3) 4 (4) 5

**43.** The energy of the electron in the second and the third Bohr's orbits of the hydrogen atom is  $-5.42 \times 10^{-12}$  erg and  $-2.41 \times 10^{-12}$  erg respectively. Calculate the approximate wavelength of the emitted radiation when the electron drops from the third to the second orbit.

- (1) 6582 Å (2) 4552 Å
- (3) 2858 Å (4) 8285 Å
- 44. Which statement is not correct regarding a mole?
  - (1) A mole of  $^{12}\mathrm{C}$  atoms contains 6.02  $\times$  10^{23} atoms.
  - (2) A mole of  $O_2$  gas contains the same number of molecules as a mole of  $H_2$  gas.
  - (3) Exactly 12 g of carbon-12 is one mole of carbon-12.
  - (4) A mole of  $O_2$  gas has the same mass as a mole of  $N_2$  gas.
- **45.** If a sudden jump between the values of second and third ionization energies of an element occurs, then it would be associated with which electronic configuration?
  - (1)  $1s^2$ ,  $2s^2 2p^6$ ,  $3s^2 3p^6$ ,  $4s^1$ (2)  $1s^2$ ,  $2s^2$ ,  $2p^6$ ,  $3s^2$ (3)  $1s^2$ ,  $2s^2 2p^6$ ,  $3s^2 3p^4$ (4)  $1s^2$ ,  $2s^2 2p^6$ ,  $3s^2 3p^1$

**46.** As per Charle's law the plot of centigrade temperature (t) against the volume of gas at definite pressure for a definite mass of gas is



If 'XY' plane contains all the atoms of  $COCl_2$ . Identify the type of  $\pi$ -bond and Nodal plane of 55.  $\pi$ -bond respectively in COCl<sub>2</sub> molecule – (1)  $2p\pi - 2p\pi$ ; XY plane (2)  $2p\pi$ - $3p\pi$ ; XZ plane (3)  $2p\pi - 2p\pi$ ; YZ plane (4)  $2p\pi - 3d\pi$ ; XY plane 56. Which among the following is isostructural with  $XeF_4$ ? (2)  $PCl_4^+$ (1) ICl<sub>2</sub> (3)  $ICl_{4}^{-}$  $(4) \text{ XeO}_{2}$ 57. The rate of diffusion of two gases X and Y is in the ratio of 1 : 5 and that of Y and Z in the ratio of 1:6. The ratio of the rate of diffusion of Z with respect to X is (2)  $\frac{1}{30}$ (3)  $\frac{6}{5}$ (1)  $\frac{5}{6}$ (4) 30 In the following reaction, the Cl - P - Cl bond angles: 58.  $PCl_5 \longrightarrow PCl_4^+ + Cl^-$ (1) All increase (2) All stay the same (4) Some increase and some decrease (3) All decrease **59**. Which of the following statements is not true ? (1) The ratio of the mean speed to the RMS speed is independent of the temperature (2) The square of the mean speed of the molecules is equal to the mean squared speed at a certain temperature (3) Mean kinetic energy of the gas molecules at any given temperature is independent of the mean speed (4) The difference between RMS speed and mean speed at any temperature for different gases diminishes as larger and yet larger molar masses are considered Molar mass of electron is nearly ( $N_A = 6 \times 10^{23}$ ) **60**. (2)  $9.1 \times 10^{-31} \text{ gm mol}^{-1}$ (1)  $9.1 \times 10^{-31} \text{ kg mol}^{-1}$ (4)  $54.6 \times 10^{-8} \text{ kg mol}^{-1}$ (3)  $54.6 \times 10^{-8} \text{ gm mol}^{-1}$ Attempt any one of the Section-D (Biology) OR Section-E (Mathematics) **SECTION-D** : **BIOLOGY** 

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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. Read the following tissue names and find out how many of them are product of differentiation (A), dedifferentiation (B) and redifferentiation (C).Cortex phelloderm secondary cortex secondary phloem primary medullary rays

Cortex, phelloderm, secondary cortex, secondary phloem, primary medullary rays, interfacicular cambium, phellum, endodermis.

(1) $A = 3, B = 1, C = 4$	(2) $A = 2, B = 1, C = 5$
(3) $A = 3, B = 3, C = 2$	(4) $A = 4, B = 3, C = 1$

## CLASS-XI / Paper Code - A

62. Match the following :i. Manuals Taxonomical aid used for identification of plants and A. animals based on the similarities and dissimilarities. ii. Monograph B. Information on any one taxon iii. Flora C. Actual account of habitat and distribution of plants of a given area. iv. Key D. Useful in providing information for identification of names of species found in area. **Option :-**(1) i-B, ii-D, iii-C, iv-A (2) i-D, ii-B, iii-A, iv-C (3) i-D, ii-B, iii-C, iv-A (4) i-B, ii-D, iii-A, iv-C 63. Observe the following : Function Structure (A) Mechanical support Lysosome (B) Intracellular exchange E.R. Cell wall (C) Autophagy (D) Formation of acrosome Golgi body How many of the above are mis-matched ? (1) Three (3) Two (4) One (2) Four The given figure represents head region of cockroach, in which of the options all the four parts A, 64. B, C and D are labelled correctly? (1) A-Labrum, B-Mandible, C-Maxilla, D-Labium (2) A-Mandible, B-Maxilla, C-Labium, D-Labrum (3) A-Maxilla, B-Mandible, C-Labium, D-Labrum (4) A-Labium, B-Maxilla, C-Labrum, D-Mandible Animals of class mammalia have :-**65**. (1) Seven cervical vertebrae (2) Seven cervical nerves (3) Single ventricular chamber (4) fourteen cervical vertebrae 66. The cohesion of stamens is shown by which one of the following conditions ? (1) Gynandrous (2) Gynostegium (3) Syngenesious (4) Epipetalous 67. Following organisms belongs to how many order ? Human, Leopard, Tiger, Solanum, Datura, Wheat, Mango, Housefly, Cat, Dog, Petunia (1) Seven (2) Four (3) Six (4) Five The floral formula  $Br \oplus \stackrel{?}{+} P_{(3+3)} A_{(3+3)} \underline{G}_{(3)}$  belongs to family **68**. (2) Solanaceae (1) Leguminosae (3) Liliaceae (4) Brassicaceae

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- **69.** Read the following statements and select the correct set of codes given below ?
  - (i) Caudal fin is heterocercal.
  - (ii) Caudal fin is homocercal.
  - (iii) Respiration by 5 to 7 pairs of gills which are uncovered.
  - (iv) Respiration takes place by 4 pairs of gills which are covered.
  - (v) They are marine but reproduction takes place in fresh water.
  - (vi) Fertilization internal.
  - (1) i, iii, vi represent Shark (2) ii, iii, v represent Ray fish
  - (3) ii, iv, v represent *Labeo* (4) ii, iv, v represent *Lamprey*
- 70. Select incorrect statement-
  - (1) Centrioles help in the organisation and development of cilia and flagella.
  - (2) Microtubules are unbranched cylilnders, generally about 25 nm in diameter with a hollow core of about 15 nm.
  - (3) Microtubules helps in pseudopodia formation.
  - (4) Intermediate filaments involved in formation of scaffolds for chromatin and in forming a basket around nucleus.
- **71.** Given figures (I and II) show two specialised connective tissues. Identify the figure I, II and the parts labelled as A and B.



	Ι	II	Α	B
(1)	Cartilage	Bone	Collagen fibres	Chondrocyte
(2)	Cartilage	Bone	Collagen fibres	Chondroclast
(3)	Bone	Cartilage	Microtubules	Osteoblast
(4)	Bone	Cartilage	Collagen fibres	Osteoblast

- 72. If mitotically dividing cell has initial amount of DNA is 5 pg in  $G_1$  stage, that is distributed among its 10 chromosome then which of the following assumption is correct.
  - (1)  $G_2$  phase 10 chromosome with 5 pg DNA
  - (2) Late prophase nucleus 20 chromosome with 20 pg of DNA
  - (3) Anaphase cell 20 chromosome with 10 pg of DNA
  - (4) S stage 5 chromosome with 5 pg of DNA

73.	The secretory material is discharged by the golgi vesicles, from the surface of cell membrane by									
	(1) Pinocytosis	(2) Endocytosis								
	(3) Reverse pinocytosis	(4) Dissolving the cell membrane								
74.	Animals of same phylum are grouped. Mark the incorrect group.									
	(1) Spider, Mosquito, Crab	(2) Rohu, Monkey, Cobra								
	(3) Snail, Octopus, Squid	(4) Earthworm, millipede, Leech								
75.	Casparian strip is made up of									
	(1) Lignin and suberin	(2) Suberin and chitin								
	(3) Cutin and cellulose	(4) Chitin and lignin								
76.	Which one of the following has two circulatory pathways ?									
	(1) Rana tigrina	(2) Whale								
	(3) Shark	(4) Cyclostomata								
77.	Select the correct statement about G <sub>1</sub> phase.									
	(1) Cell is metabolically inactive									
	(2) DNA in the cell does not replicate									
	(3) It is not a phase of synthesis of macromolecules									
	(4) Cell stops growing									
78.	Which of the following belong to coelenterata ?									
	(1) Cliona, Spongilla, Poterion	(2) Hydra, Adamsia, Gorgonia								
	(3) Hydra, Gorgonia, Poterion	(4) Hydra, Adamsia, Leucosolenia								
79.	Meiosis takes place in-									
	(1) Conidia (2) Megaspore	(3) Gemmae (4) Meiocyte								
80.	Quiescent centre in root meristem serves as									
	(1) Site for storage of food which is utilised d	(1) Site for storage of food which is utilised during maturation								
	(2) Reservoir of growth hormones									

- (3) Reserve for replenishment of damaged cells of the meristem
- (4) Region of absorption of water

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#### **SECTION-E : 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.

61. Let ⟨u<sub>n</sub>⟩ be a sequence such that u<sub>1</sub> = 1 and √u<sub>n</sub>u<sub>n+1</sub> = u<sub>n</sub> +1 for every n ∈ N, then the largest integer less than the value of √u<sub>9</sub> is

(1) 3
(2) 4
(3) 5
(4) 6

62. Let α and β are roots of equation x<sup>2</sup> - 13x + 3 = 0, then value of α + β, 1/α + 1/β are respectively :

(1) 13, 13/3
(2) 13/3, 13
(3) 13/3, 5
(4) 5, 13/3

**63.** Number of integral values of x which satisfies inequation  $\left(\frac{2x}{x^2+5x+4}\right) > \frac{2}{x+2}$  is -

(1) 1 (2) 3 (3) 4 (4) 7 64. If z is a complex number & lies on the curve |z| = 2, then minimum value of

$$A = \operatorname{Re}\left(\frac{4-z^2}{2}\right) + \frac{72}{\operatorname{Re}(4-(\overline{z})^2)}$$

(where  $\overline{z}$  represent the conjugate of a complex number) (1) 12 (2) 11 (3) 13

65. If  $\tan 6\theta = \frac{2}{3}$ , then the value of  $\frac{1}{2}(2\cos ec6\theta - 3\sec 6\theta)$  is  $\left(0 < \theta < \frac{\pi}{12}\right)$ .

(1) 
$$\sqrt{13}$$
 (2) 13 (3) 0 (4) 8

**66.** Let the slopes of the lines upon which the incident ray and line mirror lie are respectively 5 and 3, then the slope of the line upon which the reflected ray lies is

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(4) N.O.T.

67. Find the area of triangle formed by common tangents to the circles  $x^2 + y^2 - 6x = 0$  and  $x^2 + y^2 + 2x = 0$  is:

 $(3) 3\sqrt{3}$ (1)  $2\sqrt{3}$ (2) 6(4) None of these Number of integral values of x which satisfies inequation  $(x^2 - 5x + 4)(x^2 - 3x + 2) \le 0$ , is -**68**. (2) 5(3) 4(4) more than 5 (1) 3If '2' is a repeated root of cubic equation  $3x^3 + px^2 + qx - 12 = 0$ . Then the value of p + q is **69**. (2) 27 (3) 9(4) N.O.T. (1) 3

70. Let  $a_n = 16, 4, 1, \dots$  be a geometric sequence. Define  $P_n$  as the product of the first n-terms. Then the

value of 
$$\sum_{n=1}^{\infty} \sqrt[n]{P_n}$$
 is \_\_\_\_\_

(1) 16

(2) 64 (3) 32 (4) 68

71. Let a circle S = 0 and a line L = 0 are represented by  $x^2y + 4x^2 + y^3 + 4y^2 = 25y + 100$  then the length of chord intercepted by L on S is equal to

72. The equation  $6x^2 - \alpha xy - 3y^2 - 24x + 3y + \beta = 0$  represents a pair of lines that intersect on the x-axis. Then the value of  $20\alpha - \beta$  is

(1) 2 (2) 4 (3) 6 (4) 8

(4) 3

73. Complete set of values of x satisfying  $\frac{(x-1)(2x+1)}{(3x-1)} \le 0$ , is

T**ALLEN**TEX

(1) 
$$\left(-\infty, -\frac{1}{2}\right]$$
 (2)  $\left(-\infty, \frac{1}{3}\right) \cup \left[\frac{1}{2}, 1\right]$   
(3)  $\left(-\infty, -\frac{1}{2}\right] \cup \left(\frac{1}{3}, 1\right]$  (4) None of these

74. A ray of light passing through the point A(1, 2) is reflected at point B on the x-axis and then passes through (5, 3). The equation of AB is -(1) 5x - 4y = -3 (2) 4x + 5y = 14 (3) 5x + 4y = 13 (4) 4x - 5y = -6

(1) 
$$5x - 4y = -3$$
 (2)  $4x + 5y = 14$  (3)  $5x + 4y = 13$  (4)  $4x - 5y = -6$   
**75.** For a, b > 0, let 5a -b, 2a + b, a + 2b be in A.P. and  $(b + 1)^2$ , ab + 1,  $(a - 1)^2$  are in G.P., then

the value of 
$$\left(\frac{1}{a} + \frac{1}{b}\right)$$
 is \_\_\_\_\_  
(1) 6 (2) 16 (3) 8 (4) 18

76. Number of complex number z, satisfying  $z + \frac{1}{\overline{z}} = |z|$  is equal to (1) 0 (2) 1 (3) 2

77. Consider equation  $x^2 + y^2 + 2\alpha x + 2\alpha y + \beta = 0$  for  $\alpha = -1$  this equation represents family of circles centred at point A and for  $\beta = -8$  equation represents family of circles passing through B and C, then equation of incircle triangle ABC is -

$$(1)\left(x-\frac{2}{2+\sqrt{5}}\right)^{2} + \left(y-\frac{2}{2+\sqrt{5}}\right)^{2} = 8\left(\sqrt{5}-2\right)^{2} \qquad (2)\left(x+\frac{2}{2+\sqrt{5}}\right)^{2} + \left(y+\frac{2}{2+\sqrt{5}}\right)^{2} = 10\left(\sqrt{5}-2\right)^{2}$$
$$(3)\left(x+\frac{2}{2+\sqrt{5}}\right)^{2} + \left(y+\frac{2}{2+\sqrt{5}}\right)^{2} = 8\left(\sqrt{5}-2\right)^{2} \qquad (4)\left(x-\frac{2}{2+\sqrt{5}}\right)^{2} + \left(y-\frac{2}{2+\sqrt{5}}\right)^{2} = 10\left(\sqrt{5}-2\right)^{2}$$

**78.**  $\sqrt{2 + \sqrt{2 + \sqrt{2 + 2\cos 888^\circ}}}$  equals

(1)  $-2 \cos 111^{\circ}$  (2)  $-2 \sin 111^{\circ}$  (3)  $2 \cos 111^{\circ}$  (4)  $2 \sin 111^{\circ}$ 

**79.** The number of ordered pairs which satisfy the equation  $(A + iB)^{100} = A - iB$ , where  $i = \sqrt{-1}$ . (1) 100 (2) 101 (3) 102 (4) 103

80. The number of rational points on the circle  $x^2 + (y - \sqrt{3})^2 = 4$  must be (Rational points are points whose both co-ordinates are rational) (1) Zero (2) One (3) Two (4) Infinite



#### SPACE FOR ROUGH WORK

ANS	WER	KEY :	15-10	)-201	7		CLAS	S – XI						COD	)E : A
Q.No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	1	3	4	2	4	1	1	2	3	1	3	4	4	3	4
Q.No.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	1	3	1	2	2	1	3	3	1	2	1	2	3	1	3
Q.No.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	3	4	4	2	4	2	1	3	4	4	3	4	1	4	2
Q.No.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	3	3	4	2	3	3	2	3	1	1	3	4	4	2	4
Q.No.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans.	1	3	3	4	1	3	3	3	1	3	1	3	3	4	1
Q.No.	76	77	78	79	80	61	62	63	64	65	66	67	68	69	70
Ans.	2	2	2	4	3	2	1	1	3	3	4	3	3	3	3
Q.No.	71	72	73	74	75	76	77	78	79	80					
Ans.	2	3	3	3	1	1	1	4	3	3					