A Specially Designed Initiative
to Encourage Young Talent by

ALLEN CAREER INSTITUTE
path to success
KOTA (RAJASTHAN)

TALLENTEX 2017 : (23, October 2016)

PAPER CODE
A

TALLENTEX 2017

ALLEN'S Talent Encouragement Exam

CLASS - 11th (XI)

Duration: 2 Hrs. | Maximum Marks : 320

Tallentex Roll No.	5								Answer Sheet No.	T	5						

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

1. This Booklet is your Question Paper. DO NOT break seal of Booklet until the invigilator instructs to do so.
2. Fill your TALLENTEX Roll No. & Answer Sheet No. in the space provided on the cover page.
3. Carefully fill your **PAPER CODE** and present **CLASS** in space provided **(Serial No. 6 & 12)** of optical response sheet.
4. Please make sure that paper you received is of your class only.
5. 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 or blue ball point pen.
6. After breaking the Question Paper seal, check there are **16 pages** in the booklet. This Question Paper contains 80 MCQs with 4 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.
7. Think wisely before darkening bubble as **there is negative marking for wrong answer**. Answer once marked by pen cannot be cancelled.
8. 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.
9. If you are found involved in cheating or disturbing others, then your ORS will be cancelled.
10. Do not put any stain on ORS and hand it over back properly to the invigilator.
11. You can take along the question 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.**

ALLEN RESULT: JEE ADVANCED-2016

4 in Top 10 | **12** in Top 50 | **25** in Top 100 AIR

AIR : 2

Bhavesh Dhingra
Classroom

AIR : 3

Kunal Goyal
Classroom

AIR : 9

Gaurav Didwania
Classroom

AIR : 18

Rohan Garg
Classroom

AIR : 19

Animesh Bohra
Distance

AIR : 23

Ritesh Goenka
Classroom

AIR : 27

Vikrant Garg
Classroom

AIR : 29

Sharvik Mittal
Classroom

AIR : 33

Ishan Tarunesh
Distance

AIR : 36

Naman Jain
Classroom

AIR : 48

Sushil Khyalia
Classroom

Total Selections

3883

Classroom : **2857** | Distance : **1026**

ALLEN RESULT: NEET (UG)-2016

7 in Top 10 | **35** in Top 50 | **58** in Top 100 AIR

AIR : 2

Ekansh Goyal
Classroom

AIR : 3

Nikhil Bajiya
Classroom

AIR : 4

Ashank Khaitan
Distance

AIR : 6

Dyuti Shah
Distance

AIR : 7

Japnoor Kaur
Distance

AIR : 10

Utkarsh Anand
Classroom

AIR : 12

Prakhar Bansal
Classroom

AIR : 13

Lajjaben Patel
Classroom

AIR : 15

Gurasis Singh
Distance

AIR : 18

Swetank Anand
Classroom

AIR : 19

Mahak Kr. Surana
Classroom

AIR : 20

Prachi Singh
Classroom

Total Qualified

33106

Classroom : **26198** | Distance : **6908**

Authenticity of Result : Power of **ALLEN**

ALLEN RESULT: AIIMS-2016

8 in Top 10 | 25 in Top 36

AIR : 3

Lajjaben Patel
Classroom

AIR : 4

Het Sanjay Shah
Classroom

AIR : 5

Mridul Sharma
Classroom

AIR : 6

Dyuti Shah
Distance

AIR : 7

Aishvary Gupta
Classroom

AIR : 8

Kushagra Pandey
Distance

AIR : 9

Ekansh Goyal
Classroom

AIR : 11

Ira Pachori
Distance

AIR : 12

Ritik M Goyal
Classroom

AIR : 13

Amol Sood
Classroom

AIR : 17

Ashank Khaitan
Distance

AIR : 19

Dhruvil D. Shah
Classroom

AIR : 20

Swetank Anand
Classroom

AIR : 21

Ankush Garg
Classroom

AIR : 23

Sanil Garg
Distance

AIR : 25

Aditya Agarwal
Distance

AIR : 27

Vishal Saini
Distance

AIR : 28

Gurasis Singh
Distance

AIR : 29

Manavi Gupta
Classroom

AIR : 30

Anubhav Das
Distance

AIR : 31

Prachi Singh
Classroom

AIR : 32

Japnoor Kaur
Distance

AIR : 33

Ayush Jain
Classroom

AIR : 36

Sukriti Chaudhri
Distance

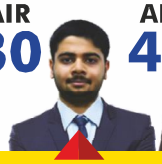
Total Qualified

602

Classroom : **405** | Distance : **197**

ALLEN RESULT: JEE Main-2016

8 in Top 100 | 25 in Top 200 | 65 in Top 500 | 136 in Top 1000

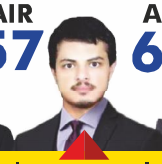
AIR 30

Syamantak Kumar
Classroom

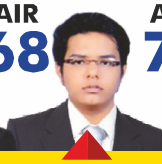
AIR 45

Mudit Surana
Classroom

AIR 47

Utkarsh G. Patel
Classroom

AIR 57

Bhavishya
Distance

AIR 68

Kapil Shobhnani
Classroom

AIR 71

Aman Bansal
Classroom

AIR 90

Ambatwar Ajinkya G.
Distance

AIR 95

Surya Suresh
Distance

AIR-105

Megh V. Thakkar
Classroom

AIR-112

Shashwat Agrawal
Classroom

AIR -127

Rohan Garg
Classroom

AIR -130

Amey Ravindra Patil
Distance

AIR-132

Akash Bhardwaj
Classroom

AIR-137

Rahul Agrawal
Classroom

AIR-145

Sharvik Mital
Classroom

AIR-151

Shashwat Shivam
Distance

AIR-158

Ankit Dhankhar
Classroom

AIR-168

Sukriti Gupta
Distance

AIR-169

Georgi Joseph Boby
Distance

AIR-171

Rushikesh Vitthal
Distance

AIR-177

Koustav Yacha
Classroom

AIR-178

Rahul M. Chanduka
Classroom

26660

Students secured JEE Main

All India Ranks from all Courses of ALLEN

AIR-185

Gavali H. Abhiman
Distance

AIR-190

Atri Dutta
Distance

AIR-197

Vansh J. Chiripal
Classroom

Authenticity of Result : Power of **ALLEN**

TALLENTEX Success Power Session & Rewards Ceremony

(29 November 2015)

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. **The following question is based on the following information :**
(i) M % N means M is the son of N
(ii) M @ N means M is the sister of N
(iii) M $ N means M is the father of N
Which of the following shows the relation that C is the granddaughter of E ?
(1) C % B $ F $ E (2) B $ F $ E % C
(3) C @ B % F % E (4) E % B $ F $ C

2. A told B, "Yesterday I met the only brother of the daughter of my grand mother." Whom did A meet ?
(1) Cousin (2) Brother (3) Nephew (4) Father

3. My office is to the East of my house. My sister's office is to the South-East of my office. A park is to the South of my office. In which direction is my house located with respect to the Park ?
(1) North-East (2) South-West (3) North-West (4) South-East

4. If CACOPHONY = 81, ALLEN= 25, PANORMA = 49, then TRANSMOGRIFY =?
(1) 125 (2) 144 (3) 91 (4) 121

5. Today is Monday. After 61 days, it will be
(1) Monday (2) Wednesday (3) Saturday (4) Friday

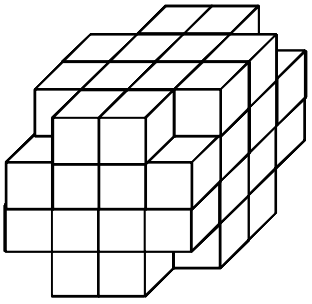
6. Find the missing term in the given series
235, 236, 234, 237, 233, 238, ?
(1) 232 (2) 235 (3) 237 (4) 231

7. A clock which gains uniformly is one minute slow at Noon on 26/09/2016. It is four minutes fast at Noon on 30/09/2016. When did it show the correct time ?
(1) 28/09/2016 at 7:12am (2) 27/09/2016 at 7:06am
(3) 28/09/2016 at 7:06am (4) 27/09/2016 at 7:12am

8. What is the angle between the hour and minute's hand, when the clock shows 30 minutes past 6?
(1) 30° (2) 15° (3) 10° (4) 20°

9. A boy was born on 29th Feb, 1896. When will he celebrate his next birthday ?
(1) 28^{th} Feb, 1897 (2) 29^{th} Feb, 1900
(3) 29^{th} Feb, 1904 (4) 20^{th} Feb, 1908

10. In the given figure a solid cube is painted on all sides by a single color. Observe the given solid and choose the correct alternative.

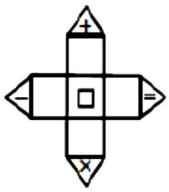


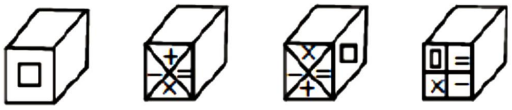
Find the total number of blocks whose only one surface is colored?
(1) 8 (2) 12 (3) 16 (4) 24

11. Four standard dice are thrown on the ground. The total of numbers on the top faces of these four dice is 13 as the top faces showed 4, 3, 1 and 5 respectively. What is the total of the faces touching the ground ?

(1) 12 (2) 15 (3) 13 (4) 16

12. Select the correct answer choice(s) which is/are formed by folding the unfolded dice.





I II III IV

(1) I and II (2) II and III (3) I and III (4) II and IV

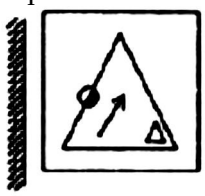
13. Faces of a large cube are painted with six different colours-Red, Violet Yellow, Green, Orange and Blue. Green and Violet are opposite to each other. Red and Orange are opposite to each other. The cube is placed on a table with the Yellow face touching the table and the Orange face is towards the front. The cube is cut into 210 identical pieces by making the least number of cuts. Out of the total cuts made the maximum number of cuts are made in the horizontal direction and the least number of cuts in the direction parallel to the Violet face.

How many pieces have atmost one face painted ?

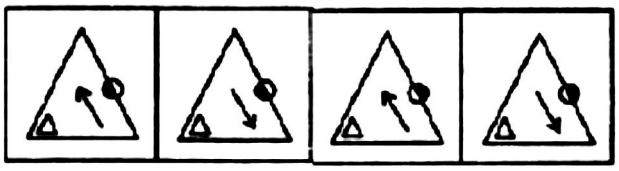
(1) 116 (2) 124 (3) 142 (4) 154

14. In the following question, choose the correct mirror image of the figure (X) from amongst four alternatives.

M_1



M_2



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

15. There are six teachers A, B, C, D, E and F in a school. Each of the six teachers teaches two subjects, one compulsory subject and other optional subject. D's optional subject was History while three others have it as compulsory subject. E and F have Physics as one of their subjects. F's compulsory subject is Mathematics which is an optional subject of both C and E. History and English are A's subjects but in terms of compulsory and optional subject they are just reverse of those of D's. Chemistry is an optional subject of only one of them. The only female teacher in the school has English as her compulsory subject.

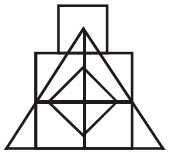
What is C's compulsory subject ?

(1) History (2) Physics (3) Mathematics (4) English

16. In a certain code language 'they have come back' is written as 'na ja sa da' and 'they have gone there' is 'written as 'da ka pa na'. How is 'come' written in that code language?

(l) sa (2) na (3) ja (4) sa or ja

17.



Count the number of triangles and squares in the figure

(1) 21 triangles, 7 squares (2) 18 triangles, 8 squares

(3) 20 triangles, 8 squares (4) 22 triangles, 7 squares

18. Give your answer as :

(1) If only conclusion I follows

(2) If only conclusion II follows

(3) If either I or II follows

(4) If neither I nor II follows

Statement : 1. Some hats are caps.
2. Some caps are mats.

Conclusions : I. Some caps are hats.
II. Some mats are hats.

19. **Statements :** Some keys are staplers. Some staplers are stickers. All stickers are pens :

Conclusion : (I) Some pens are staplers
(II) Some stickers are keys
(III) No sticker is key
(IV) Some staplers are keys.

(1) Only (I) and (II) follow

(2) Only (II) and (III) follow

(3) Only (II) and (IV) follow

(4) Only (I) and (IV) and either (II) or (III)

20. If the first and the third letters in the letter group DISTRIBUTION are interchanged and also the second and fourth letters, the fifth and seventh and so on then which of the following would be seventh letter from the left ?

(1) U (2) R (3) B (4) T

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 postion vector of a particle is given as $\vec{r} = (t^2 - 4t + 6)\hat{i} + (t^2)\hat{j}$. The time, after which the velocity vector and acceleration vector becomes perpendicular to each other, is equal to–

(1) 1 sec (2) 2 sec (3) 1.5 sec (4) not possible

22. An explosive of mass 18 kg is located at position vector $\vec{r}_0 = 6\hat{i}+14\hat{j}+20\hat{k}$ in gravity free space. It breaks into four parts of masses 5kg, 3kg, 4kg and 6 kg respectively. After sometime the position vector of first three parts are $10\hat{i}+20\hat{j}+9\hat{k}, 8\hat{j}+25\hat{k}$ and $4\hat{i}+10\hat{j}+20\hat{k}$ respectively. Find the position vector of the fourth part at that time?

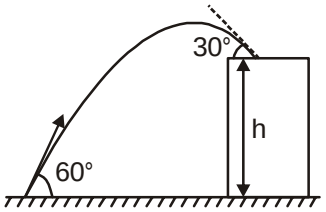
(1) $\frac{\hat{i}+3\hat{j}+\hat{k}}{3}$ (2) $3\hat{i}+\frac{29}{3}\hat{j}+\frac{80}{3}\hat{k}$ (3) $-\hat{i}+2\hat{j}+3\hat{k}$ (4) None of these

23. Which of the following pair have same dimensions?

(1) Force and strain (2) Force and stress

(3) Angular velocity and frequency (4) Energy and strain

24. A stone projected at an angle of 60° from the ground level strikes at an angle of 30° on the roof of a building of height 'h'. Then the speed of projection of the stone is–



(1) $\sqrt{2gh}$ (2) $\sqrt{6gh}$ (3) $\sqrt{3gh}$ (4) $\sqrt{gh}$

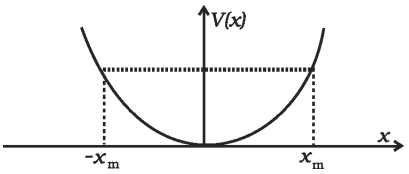
25. A block of mass M is moving on a smooth horizontal surface with constant speed u. Bullets are fired horizontally against the block to reduce the velocity of the block to half its initial value. Bullets get embedded in the block. Mass of each bullet is 'm' and speed 'u'. Then the number of bullets required is–

(1) $\frac{M}{3m}$ (2) $\frac{M}{m}$ (3) $\frac{M}{2m}$ (4) None of these

26. A bucket tied to a string is lowered at a constant acceleration of g/4. If the mass of the bucket is M and is lowered by distance d, the work done by the string will be– (assume the string to be massless)

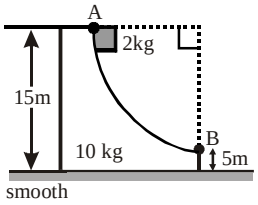
(1) $\frac{1}{4}Mgd$ (2) $\frac{-3}{4}Mgd$ (3) $\frac{-4}{3}Mgd$ (4) $\frac{4}{3}Mgd$

27. The potential energy function for a particle executing linear SHM is given by $V(x)=\frac{1}{2}kx^2$ where *k* is the force constant of the oscillator (Fig.). For *k* = 0.5N/m, the graph of *V(x)* versus *x* is shown in the figure. A particle of total energy *E* turns back when it reaches $x = \pm x_m$. If *V* and *K* indicate the P.E. and K.E., respectively of the particle at $x = +x_m$, then which of the following is correct?



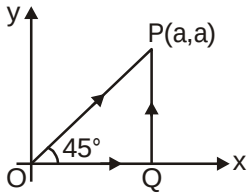
(1) $V = 0, K = E$ (2) $V = E, K = 0$ (3) $V < E, K = 0$ (4) $V = 0, K < E$.

28. A block of mass 2 kg is released at point A on a rough platform (μ = 0.1) of mass 10 kg as shown in figure. Block reaches point B with velocity 12 m/s w.r.t. platform find work done by friction ?



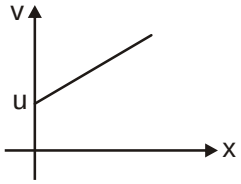
(1) – 100 J (2) – 80J (3) – 56J (4) 100J

29. A particle is moved from (0, 0) to (a, a) under a force $F = (3\hat{i} + 4\hat{j})$ from two paths. Path 1 is OP and and path 2 is OQP. Let W_1 and W_2 be the work done by this force in these two paths. Then–



(1) $W_1 = W_2$ (2) $W_1 = 2W_2$ (3) $W_2 = 2W_2$ (4) $W_2 = 4W_1$

30. A particle moves along x-axis in positive direction. Its acceleration 'a' is given as a = cx + d, where x denotes the x-coordinate of particle, c and d are positive constants. Velocity position graph of particle is as shown in following figure. The value of speed of particle at x = 0 should be–

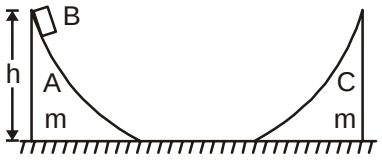


(1) $\sqrt{\frac{4d^2}{c}}$ (2) $\sqrt{\frac{d^2}{c}}$ (3) $\sqrt{\frac{2d^2}{c}}$ (4) $\sqrt{\frac{8d^2}{c}}$

31. Three forces are acting on a particle of mass m initially in equilibrium. If the first two force (R_1 and R_2) are perpendicular to each other and suddenly the third force (R_3) is removed, then the acceleration of the particle is–

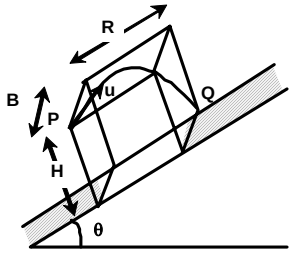
(1) $\frac{R_3}{m}$ (2) $\frac{R_1 + R_2}{m}$ (3) $\frac{R_1 - R_2}{m}$ (4) $\frac{R_1}{m}$

32. In the given figure shown a small block B of mass m is released from the top of a smooth movable wedge A of the same mass m. The height of wedge A shown in figure is h = 100 cm. B ascends movable smooth wedge C of the same mass. Neglecting friction any where find the maximum height (in cm) attained by block B on wedge C



(1) 25 (2) 30 (3) 35 (4) 40

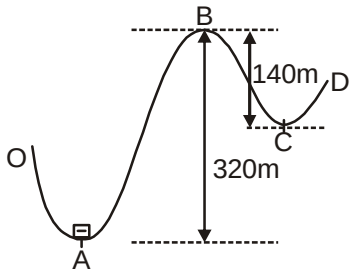
33. A box of dimension H × B × R is kept on a frictionless inclined plane as shown in the figure. A stone is thrown from one corner P with speed u parallel to the ceiling of the box such that it hits the floor of the box. At the same instant, the box is released to slide down the plane. Calculate the time of flight.



(1) $\sqrt{\frac{2H}{g\cos\theta}}$ (2) $\sqrt{\frac{2H}{g}}$

(3) $\sqrt{\frac{H}{g\cos\theta}}$ (4) Cannot be calculated.

34. Track OABCD (as shown in the following figure) is smooth. What minimum speed has to be given to a particle lying at point A, so that is can reach point C? (take g = 10 m/s^2)

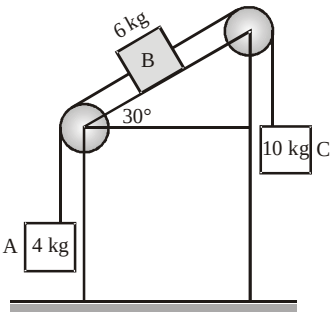


(1) 60 m/s (2) 100 m/s (3) 70 m/s (4) 80 m/s

35. A spherical body of mass m and radius r is allowed to fall in a medium of viscosity η. The time in which the velocity of the body increases from zero to 0.63 times the terminal velocity (ν) is called time constant (τ). Dimensionally, τ can be represented by–

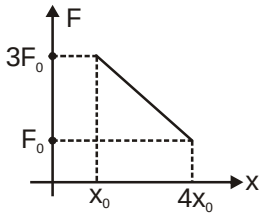
(1) $\frac{mr^2}{6\pi\eta}$ (2) $\sqrt{\frac{6\pi mr\eta}{g^2}}$ (3) $\frac{m}{6\pi\eta r\nu}$ (4) None of these

36. Three blocks A, B and C of mass 4 kg, 6kg and 10 kg respectively are connected as shown in figure. Find acceleration of block A ?
[g = 10 m/s^2]



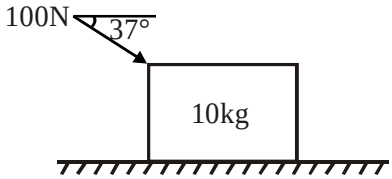
(1) 10 m/s^2 (2) 1.5 m/s^2 down (3) 3 m/s^2 upward (4) 1.5 m/s^2 upward

37. A particle of mass m moving along a straight line experience force F which varies with the distance traveled as shown. If the velocity of the particle at x_0 is $\sqrt{\frac{2F_0x_0}{m}}$, then velocity at $4x_0$ is–



(1) $2\sqrt{\frac{2F_0x_0}{m}}$ (2) $2\sqrt{\frac{F_0x_0}{m}}$ (3) $\sqrt{\frac{F_0x_0}{2m}}$ (4) $\sqrt{\frac{14F_0x_0}{m}}$

38. In the figure shown below, calculate the angle of friction. The block does not slide. Take g = 10 m/s^2.

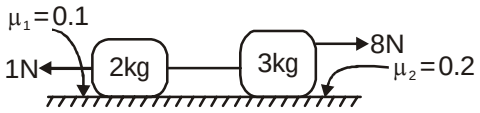


(1) $\tan^{-1}\frac{1}{2}$ (2) $\tan^{-1}\frac{1}{4}$ (3) $\cot^{-1}\frac{1}{2}$ (4) $\cot^{-1}\frac{1}{4}$

39. The potential energy of particle of mass m free to move along x-axis is given by $U=\frac{1}{2}kx^2$ for $x < 0$ and $U = 0$ for $x \geq 0$ (x denotes the x-coordinate of the particle and k is a positive constant). If the total mechnical energy of the particle is E, then its speed at $x=\sqrt{\frac{2E}{k}}$ is–

(1) zero (2) $\sqrt{\frac{2E}{m}}$ (3) $\sqrt{\frac{E}{m}}$ (4) $\sqrt{\frac{E}{2m}}$

40. In the following arrangement if f_1, f_2 and T be the frictional force on 2kg block, 3kg block and tension in the string respectively, then their values are–



(1) 2N, 6N, 3.2 N
(2) 2N, 6N, 0 N
(3) 1N, 6N, 2 N
(4) Data is insufficient to calculate the required values

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 wavelength emitted during the transition of electron in betweeen two levels of Li^{+2} ion whose sum is 4 and difference is 2 is :

(1) 1.14×10^{-6} cm (2) 11.4×10^{-6} cm

(3) 0.114×10^{-6} cm (4) 11.40×10^{-6} cm

42. The NH_3 evolved from 1.40 gm sample of protein was absorbed in 45 ml of 0.4 N HNO_3. The excess acid required 20 ml of 0.1 M NaOH. The % N in the sample is

(1) 8 (2) 16 (3) 19.42 (4) None

43. λ_0 is the threshold wavelength of a metal for photoelectron emission. If the metal is exposed to the light of wavelength λ, then the maximum velocity of ejected electron will be $\sqrt{\frac{2h}{m}(\lambda_0 - \lambda)} \times K$. The value of K is:

(1) speed of light (2) 1 (3) $\sqrt{\frac{c}{\lambda_0 \lambda}}$ (4) $\sqrt{\frac{1}{\lambda \lambda_0}}$

44. 1M HCl and 2M HCl are mixed in the volume ratio of 4 : 1. What is the final molarity of HCl solution

(1) 1.5 (2) 1 (3) 1.2 (4) 1.8

45. The **CORRECT** order of $I.E_2$ is :

(1) Ne > F > O > N (2) O > F > Ne > N

(3) Ne > O > F > N (4) O > Ne > F > N

46. Three closed vessels A, B and C are at the same temperature T and contain gases which obey the Maxwellian distribution of velocities. Vessel A contains only O_2, B only N_2 and C a mixture of equal quantities of O_2 and N_2. If the average speed of the O_2 molecules in vessel A is V_1, that of the N_2 molecules in vessel B is V_2, the average speed of the O_2 molecules in vessel C is -

(1) $\frac{(V_1 + V_2)}{2}$ (2) V_1

(3) $(V_1 \cdot V_2)^{1/2}$ (4) $\sqrt{3kT/M}$

47. How many milliliters of 0.1 M H_2SO_4 must be added to 50 ml of 0.1 M NaOH to give a solution that has a concentration of 0.05 M in H_2SO_4 ? Assume no $NaHSO_4$ formation.

(1) 400 ml (2) 200 ml

(3) 100 ml (4) 50 ml

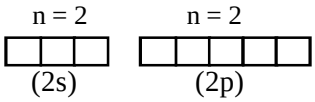
48. A 4 : 1 mixture of helium and methane is contained in a vessel at 10 bar pressure. Due to a hole in the vessel, the gas mixture leaks out. The molar composition of mixture effusing out initially is (He : CH_4)

(1) 8 : 1 (2) 8 : 3 (3) 4 : 1 (4) 1 : 1

49. Find the group number and the number of unpaired electrons present in an element having following atomic electronic configuration of outermost and penultimate shell $(n-1)s^2p^6d^{10}ns^1$.

(1) 1,0 (2) 11,1 (3) 1,1 (4) 11,0

50. Consider 2^{nd} shell in a hypothetical system of atom given :-



It is possible when value of magnetic quantum number are :-

(1) $-l$ to zero to $+l$ in integral steps

(2) $-(l-1)$ to zero to $+(l-1)$ in integral steps

(3) $-(l+1)$ to zero to $+(l+1)$ in integral steps

(4) $-(l+1)$ to zero to $+(l-1)$ in integral steps

51. Select the **CORRECT** order of ionic radius:

(1) $H^+ > H$ (2) $H > H^-$ (3) $H^+ < H > H^-$ (4) $H^+ < H < H^-$

52. Maximum number of electrons that can be accommodated in the M^{th} shell is :

(1) 2 (2) 8 (3) 18 (4) 32

53. The bond strength in O_2^+ , O_2 , O_2^- & O_2^{2-} follows the order:

(1) $O_2^{2-} > O_2^- > O_2 > O_2^+$ (2) $O_2^+ > O_2 > O_2^- > O_2^{2-}$

(3) $O_2 > O_2^- > O_2^{2-} > O_2^+$ (4) $O_2^- > O_2^{2-} > O_2^+ > O_2$

54. With the increase in temperature of a gas, the fraction of molecules having velocities within a given range around the most probable velocity (for same change in speed), would

(1) increase (2) decrease

(3) remain unchanged (4) initially increase and then decrease

55. The **INCORRECT** order of bond angle is :

(1) $CO_2 > CO_3^{2-} > CF_2Cl_2$ (2) $NO_2^+ > NO_3^- > NO_2^-$

(3) $XeF_2 > XeF_4 > XeO_4$ (4) $PH_3 > AsH_3 > SbH_3$

56. Hybridisation of 'B' in the anionic part of Borax is :

(1) sp only (2) sp^2 only

(3) sp^3 only (4) both sp^2 & sp^3

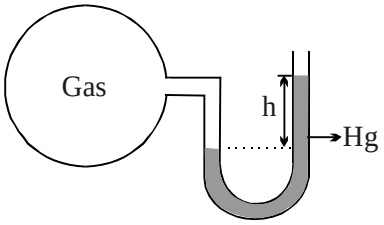
57. The root mean square speed of the molecules of diatomic gas is u. When the temperature is doubled, the molecules dissociates into two atoms. The new rms speed of the atoms is :

(1) $\sqrt{2}u$ (2) u (3) 2u (4) 4u

58. The **CORRECT** order regarding the electronegativity by hybrid orbitals of carbon is

(1) $sp < sp^3 < sp^2$ (2) $sp < sp^2 < sp^3$ (3) $sp^2 > sp > sp^3$ (4) $sp > sp^2 > sp^3$

59. A bulb of constant volume is attached to a very thin manometer tube as shown in figure. Gas starts leaking through a small hole in the bulb causing change in pressure as $\frac{dP}{dt} = -kP^2$



Atmospheric pressure = 76 cm of Hg

Where **k** is constant and **P** is pressure at any instant.

Initial height difference '**h**' was 76 cm and after 10 min '**h**' was 38cm.

Calculate the value of **k** in unit of $\mathbf{atm^{-1}Hr^{-1}}$.

(1) 1.00 (2) 2.00 (3) 0.5 (4) 5.00

60. On reduction with hydrogen, 3.6 g of an oxide of metal left 3.2 g of metal. If the vapour density of metal is 32, the simplest formula of the oxide would be :

(1) MO (2) M_2O_3 (3) M_2O (4) M_2O_5

Attempt any one of the Section-D (Biology) OR Section-E (Mathematics)

SECTION-D : 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 of the following is correct regarding cells which are responsible for the hardness of fruit walls of nuts ?

(1) These cells are rich in protoplasm and are also found in the hypodermis of dicot stem

(2) These cells are loosely packed with large intercellular spaces and also perform various functions like photosynthesis, secretion etc.

(3) These cells are dead, without protoplast and also found in the leaves of tea

(4) These are continuously dividing cells and are responsible for producing the secondary tissues

62. Which of the following statements regarding biological nomenclature is not correct ?

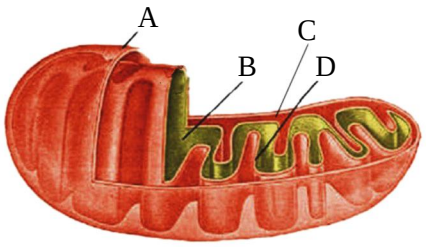
(1) Biological names are generally in Latin

(2) The first word in a biological name represents the genus while the second component denotes the specific epithet

(3) The name of genus starts with a small letter while the specific epithet starts with a capital letter

(4) Both the words in a biological name are printed in italics to indicate their Latin origin

63.



To increase ATP production in above given cell organelle , the number or amount or diameter of which part among A, B, C or D should primarly increase?

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

64. Read the following features and identify the animal from the given options.

(a) Exoskeleton of chitin.

(b) Malphigian tubule as excretory organ.

(c) Tracheal system for respiration.

(d) 3 pair of legs in thoracic region.

(1) *Limulus* (2) Prawn

(3) Spider (4) Cockroach

65.

Which of the following option is incorrect about diagrammatic view of structure shown in the above figure?

(1) It is cnidoblast or cnidocyte.

(2) It contains the stinging capsule nematocyst.

(3) It is found in *Ctenoplana* and used for anchorage, defence and for capture of prey.

(4) It is found on the tentacles and the body of Cnidarians.

66. Conjoint, collateral, open and endarch vascular bundles are found in :-

(1) Dicot roots (2) Monocot roots

(3) Dicot stems (4) Monocot stems

67. Key is another taxonomical aid used for _____ A _____ of plants and animals. The keys are based on the _____ B _____ characters generally in a pair called couplet. Keys are generally _____ C _____ in nature.

Choose the correct words respectively for A,B & C from the following options :-

(1) Identification, Contrasting, Quantitative

(2) Classification, Similar, Qualitative

(3) Nomenclature, Common, Analytical

(4) Identification, Contrasting, Analytical

68. Which tissue provides support and protection to softer organs and tissues :-

(1) Areolar connective tissue

(2) Adipose connective tissue

(3) Bone

(4) Blood

69. Mark the option with incorrect combination of the animal phylum and its unique characteristics ?

(1) Porifera - Water vascular system which helps in locomotion

(2) Mollusca - Rasping organ for feeding called "radula"

(3) Aschelminthes - Pseudocoelom developed from embryonic blastocoel

(4) Ctenophora - Ciliary comb plates for swimming

70. Which phase is marked by terminalisation of chiasmata?

(1) Diakinesis (2) Diplotene

(3) Pachytene (4) Zygotene

71. Sclerenchyma : Lignin : : Collenchyma : _____A _____

Trichomes : Multicellular : : Root hairs : _____B _____

Sapwood : Water conduction : : Heart wood : _____C _____

Choose the correct option for A,B and C from the following options : -

(1) A = Suberin B = Unicellular C = Food conduction

(2) A = Pectin B = Multicellular C = Water conduction

(3) A = Lignin B = Multicellular C = Food storage

(4) A = Hemicellulose B = Unicellular C = Mechanical support

72. If the microtubular arrangement of axoneme of cilium or flagellum is replaced by the microtubular arrangement of centriole then after replacement, in cilium or flagellum :-

(1) There will be 9 less peripheral microtubules & 2 more central microtubules

(2) There will be 2 less peripheral microtubules & 9 more central microtubules

(3) There will be 2 more peripheral microtubules & 9 less central microtubules

(4) There will be 9 more peripheral microtubules & 2 less central microtubules

73. Fluidity of plasma membrane is due to–

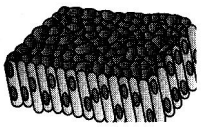
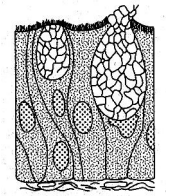
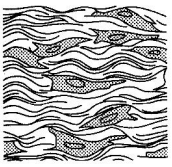
(1) Glycoproteins

(2) Carbohydrates

(3) Lipids

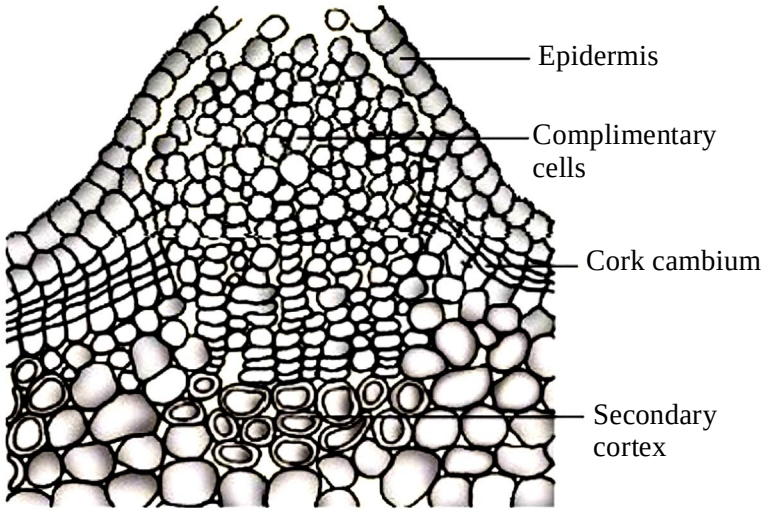
(4) Proteins

74. The four sketches (A, B, C and D) given below, represent four different types of animal tissues. Which one of these is correctly identified in the options given, along with its correct location and function?

(A)  (B)  (C)  (D) 

	Tissue	Location	Function
1	(C) Collagen fibres	Cartilage	Attach skeletal muscles to bones
2	(D) Smooth muscle tissue	Heart	Heart contraction
3	(A) Columnar epithelium	Nephron	Secretion and absorption
4	(B) Glandular epithelium	Intestine	Secretion

75.



Identify the above given figure and choose the correct option from the following :-

(1) Stomata (2) Axillary bud (3) Lenticel (4) Leaf Primordium

76. Ureter and Urinary bladder are internally lined by -

(1) Stratified squamous epithelium

(2) Stratified columnar epithelium

(3) Transitional epithelium

(4) Stratified cuboidal epihelium

77. If in a cell 10 tetrads are present in prophase-I, then what will be the number of chromatids in each cell during Metaphase - I, Metaphase-II, Anaphase - I and Anaphase-II ?

	Metaphase - I	Metaphase - II	Anaphase - I	Anaphase - II
(1)	40	20	40	20
(2)	40	10	20	10
(3)	20	40	20	40
(4)	10	20	10	20

78. Which one is a not an example of Urochordata ?
(1) *Ascidia* (2) *Salpa* (3) *Doliolum* (4) *Amphioxus*

79. In animal cells, lipid like steroidal hormones are synthesised in –
(1) RER (2) SER (3) Golgi complex (4) Mitochondria

80. Which of the following phylum includes triploblastic & metamerically segmented animals having closed circulatory system :-
(1) Aschelminthes (2) *Annelida* (3) Mollusca (4) Hemichordata

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. $\sum_{n=1}^{\infty}\frac{n}{4n^4+1}$ equals to

(1) 0 (2) 1 (3) $\frac{1}{2}$ (4) $\frac{1}{4}$

62. If roots of the equation $x^2 + x + 1 = 0$ are α and β then $(1-\alpha)(1-\beta)$ is equal to
(1) 1 (2) 2 (3) 3 (4) 4

63. The least integral value of k such that $(k-2)x^2+8x+k+4$ is positive for all real values of x is
(1) 1 (2) 2 (3) 3 (4) 5

64. If z is a complex number satisfying the equation $|z - (1 + i)|^2 = 2$ and $\omega = \frac{2}{z}$,

then the locus traced by 'ω' in the complex plane is
(1) $x - y - 1 = 0$ (2) $x + y - 1 = 0$ (3) $x - y + 1 = 0$ (4) $x + y + 1 = 0$

65. Sum of maximum and minimum value of the function $f(x) = \sin^2 x + 8\cos x - 7$ is
(1) –4 (2) –5 (3) 4 (4) –14

66. In a triangle formed by the lines $xy = 0$ and $2x + 3y = k$ is 192 sq. units then k is equal to :
(1) 12 (2) 24 (3) 48 (4) 36

67. $\frac{x}{a}+\frac{y}{b}=1$ touches the circle $x^2 + y^2 = r^2$ then the point $\left(\frac{1}{a},\frac{1}{b}\right)$ lies on

(1) $x^2 + y^2 = 1$ (2) $x^2+y^2=\frac{1}{r^2}$ (3) $x^2 + y^2 = r^2$ (4) $x^2 + y^2 = 2r^2$

68. If $|x^2 - 4| + |x^2 - 9| = 5$ for
$x \in [\alpha,\beta]\cup[\gamma,\delta]$ then $|\alpha|+|\beta|+|\gamma|+|\delta|$ is equal to
(1) 20 (2) 6 (3) 10 (4) 12

69. Let α, β, γ, δ be the roots of $x^4-x^3-x^2-1=0$. Also consider $p(x)=x^6-x^5-x^3-x^2-x$. Then the value of $p(\alpha)+p(\beta)+p(\gamma)+p(\delta)$ is equal to
(1) 4 (2) 5 (3) 6 (4) 7

70. $\sum_{n=1}^{100}(-1)^n.n$ is equal to

(1) 25 (2) 50 (3) 75 (4) 100

71. Two circles are drawn through the points A(3,2) and B(–1,4) to touch the x-axis. If the distance between their centres is k times AB, then value of k is-

(1) $20\sqrt{2}$ (2) $2\sqrt{5}$ (3) $2\sqrt{10}$ (4) 6

72. If lines $(\lambda\alpha)x + y + 7 = 0$, $\mu x + (\lambda\alpha)y + 3 = 0$ and $-x + y + 4 = 0$ are concurrent where $\alpha \in R$ and $\lambda \neq 0$ then greatest possible integral value of μ is

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

73. Number of integral value(s) of x satisfying the equalities $2x + 3 \leq 6x - 1$ and $\frac{x+3}{x-2} \geq 4$, is

(1) 0 (2) 1 (3) 2 (4) 3

74. Let α and β be the roots of the quadratic equation $x^2 - 2x - p = 0$. If the line $\alpha x + \beta y = 4$ always passes through fixed point (a,b), then the value of a + b is $(p,\alpha,\beta,a,b \in R)$

(1) 4 (2) –4 (3) 0 (4) –1

75. The sum of the first three terms of an increasing G.P. is 21 and the sum of their squares is 189. Then the sum of its first n terms is

(1) $3(2^n - 1)$ (2) $12\left(1-\frac{1}{2^n}\right)$ (3) $6\left(1-\frac{1}{2^n}\right)$ (4) $6(2^n - 1)$

76. If Z be any complex number such that $|4Z - 1| + |4Z + 3| = 4$ then locus of Z is

(1) A circle (2) An ellipse (3) A line segment (4) none of these

77. If the equation of pair of direct common tangent to the circles $(x + 2)^2 + y^2 = 1$ and $(x - 4)^2 + y^2 = 9$ is given by $x^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$. Then $b^2 - c$ is equal to

(1) 39 (2) 93 (3) 36 (4) 35

78. $\tan(\theta - \alpha) = a$ and $\tan(\theta + \alpha) = b$ then $\tan 2\alpha$ equals to

(1) $\frac{a+b}{1-ab}$ (2) $\frac{b-a}{1+ab}$ (3) $\frac{a-b}{1+ab}$ (4) none of these

79. If the fourth roots of unity are z_1, z_2, z_3, z_4, then $z_1^2 + z_2^2 + z_3^2 + z_4^2$ is equal to

(1) 1 (2) 0 (3) i (4) none of these

80. The locus of mid points of the chords of the circle $x^2 - 2x + y^2 - 2y + 1 = 0$ which are of unit length is

(1) $(x - 1)^2 + (y - 1)^2 = \frac{3}{4}$ (2) $(x - 1)^2 + (y - 1)^2 = 2$

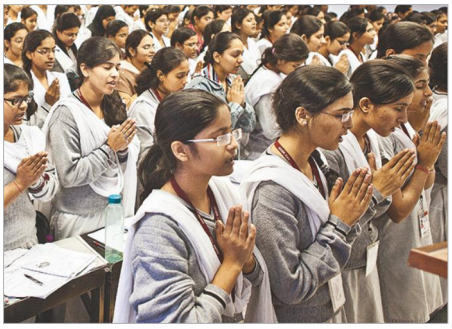
(3) $(x - 1)^2 + (y - 1)^2 = 4$ (4) none of these

SPACE FOR ROUGH WORK

ALLEN System

Orientation Session

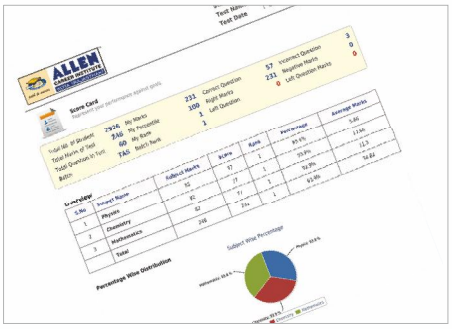
Classroom Session



Prarthana

Open Session & Medal Distributions

Regular Test



Test Result - (CSAT)

Continuous Communication

Doubt Removal Counters

Online Practice Lab

Comprehensive Study Material	Ultimate Care	Board Work Sheets, Booklets
RACE : Regular Analysis through Continuous Exercise	Best Faculties	Expert Counselling

ALLEN Students Bring Glory to Nation through their International Achievements-2016

International Chemistry Olympiad

48th International Chemistry Olympiad
IChO-2016
TBILISI, GEORGIA

Silver Medal
SHARVIK MITTAL

International Physics Olympiad

47th International Physics Olympiad
IPhO-2016
SWITZERLAND

Silver Medal
DIVYANSH GARG
(Classroom)

International Biology Olympiad

27th International Biology Olympiad
IBO-2016
HANOI, VIETNAM

Gold Medal
LAJJA BEN PATEL
(Classroom)

Silver Medal
VIDUSHI VARSHNEY
(Classroom)

International Earth Science Olympiad

10th International Earth Science Olympiad
(IESO) 2016
JAPAN

Silver Medal
AMARJIIT VIKAS PANDE
(Classroom)

ALLEN Results : Pre-Nurture & Career Foundation (2015-16)

STAGES OF OFFICIAL OLYMPIADS MENTORED BY HBCSE

IJSO

STAGE 1
35 Selections in NSEJS
STAGE 2
16 Selections in INJSO
STAGE 3
3 Selections in OCSC
NISHANT ABHANGI
AYUSHMAN TRIPATHY
GAURANG
selected for IJSO 2016

International Junior Science Olympiad

IBO

STAGE 1
3 Selections in NSEB
STAGE 2
3 Selections in INBO
STAGE 3
3 Selections in OCSC
VIDUSHI VARSHNEY
Got Silver Medal In IBO 2016

International Biology Olympiad
JEEVESH is the youngest in the country so far to qualify stage-1 of IBO

IChO

STAGE 1
1 Selection in NSEC
DHYEY SANKALP GANDHI
is the youngest in the country so far to qualify stage-1 of IChO

International Chemistry Olympiad

IOAA

STAGE 2
RAYYAN SHAHID
selected in INJAO 2016

International Astronomy Olympiad Junior

IMO

STAGE 1
190 Selections
from Gujarat & 11 from Maharashtra for RMO through PRE RMO.
3 STUDENTS SECURED 100% MARKS
STAGE 2
14 Selections in RMO for INMO

International Maths Olympiad

IESO

STAGE 1
NET – 6 Selections Conducted by Geological Society of India

International Earth Science Olympiad

IJSO

IJSO-2015

12th International Junior Science Olympiad
(IJSO) 2015
KOREA

Gold Medal
BHASKAR GUPTA
(Classroom)

Gold Medal
LAKSHYA SHARMA
(Classroom)

Silver Medal
VIDUSHI VARSHNEY
(Classroom)

International Junior Science Olympiad

APTITUDE IN SCIENCE / MATHEMATICS

NSO

571 Selections in NSO (Level-1)

NISHANT ABHANGI: **AIR-1** (Level-2)

NSO National Science Olympiad

Conducted by Science Olympiad Foundation, New Delhi

STSE 2015

36 Selections for Scholar Certificate

155 Selections for Distinction Certificate

STSE State Talent Search Examination

Conducted by Rajasthan Board of Secondary Education

NSTSE

232 Selections in NSTSE (Level-1)

63 Selections in NSTSE (Level-2)

NISHANT ABHANGI: **AIR-1** (Level-2)

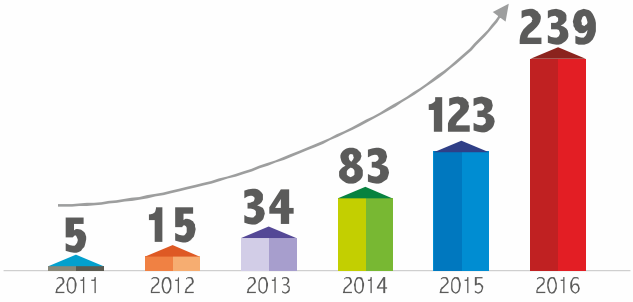
NSTSE National Science Talent Search Examination

Conducted by Unified Council, Hyderabad

NTSE

239 Students Selected From **ALLEN**

NTSE 2016 (STAGE-2)



APTITUDE IN MATHEMATICS

NMTC

274 Selections in NMTC (Prelim)

17 Selections in NMTC (Final)

NMTC National Mathematics Talent Contest

Conducted by Association of Mathematics Teachers of India, Chennai

IMO (SOF)

370 Selections in IMO (Level-1)

IMO International Mathematics Olympiad

Conducted by Science Olympiad Foundation, New Delhi

APTITUDE IN INFORMATION TECHNOLOGY

UCO

140 Selections in UCO (Level - 1)

59 Selections in UCO (Level - 2)

UCO Unified Cyber Olympiad

Conducted by Unified Council, Hyderabad

SCIENTIFIC APTITUDE

BALSHREE HONOUR

14 Selections in Balshree in Local Round Rajasthan-7 | Gujrat-5 Madhya Pradesh-2)

Consist of Plaque, Citation, ₹15000 & Literature set

Conducted by National Bal Bhavan

LANGUAGE PROFICIENCY

TRINITY GESE

38 Selections in TRINITY GESE Distinction : 21 Merit : 17

GESE Grade Examination for Spoken English

Conducted by Trinity College, London

WORKSHOP/CONFERENCES

NMC

9 Selections in NMC Including Ranks 1,2,3 & 4

NMC National Maths Conference

Conducted by Association of Mathematics Teachers of India, Chennai

APTITUDE IN INTELLIGENCE QUATIENT (IQ)

TECHNOTHLON PRELIMS 2015

20 Students (10 Teams) Selected for Techniche

29 Selections for Silver Certificate in Technothlon Prelims

Conducted by IIT Guwahati

Technothlon the international school championship ....Inspiring Young minds!

TECHNICHE 2015

2 Students (1 Team)
KHUSHI TIBAREWAL
STUTI SHAH
won Junior Squad in Techniche

Conducted by IIT Guwahati

Techniche Indian Institute of Technology Guwahati

TECHKRITI

7 Students (Including AIR-1 & AIR-3) Selected in Techkriti

Conducted by IIT Kanpur

TSC

ALLEN Champion's Day 3rd Edition

(21 August 2016)

India's Unique

Self Nominated

CHAMPION'S HONOR AND MENTORING PROGRAM

- No Fee
- No Examination
- Just Nomination!

4th Edition

2017 ALLEN Champ
Honoring & Mentoring

Registrations Open

Helpline No. : 97998-45888, 97998-46888 | www.allenchamp.com

Corporate Office "SANKALP", CP-6, Indra Vihar, Kota (Rajasthan)-324005 Trin :+91-744-5156100 | E-Mail : info@allen.ac.in | www.allen.ac.in

Answer Key

TALLENTEX 2017
ALLEN'S Talent Encouragement Exam

Class- 11th (XI)

Held on : 23 October 2016

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

path to success
ALLEN CAREER INSTITUTE
KOTA (RAJASTHAN)