TECHNOTHLON

TEAM DETAILS:

Names of Candidates: 1._____

2._____

Team Registration No: _____

Name of School: _____

Place: **State** _____

City _____

INSTRUCTIONS:

1. Candidates must **fill the Team Details** above before starting to attempt the questions.

2. This Question Paper consists of **6 parts** and carries a total of **100 Marks**.

3. **NO Question** contains negative marking.

4. Each section contains details on **how to attempt the question** of that section and the **marks that they carry**.

5. ALL ANSWERS must be written in the **answer space provided at the end of this booklet**. No extra space will be provided.

6. ALL ANSWERS must be **clear and legible**. In case of any ambiguity, the decision of the evaluator is final.

7. In case an answer has to be changed, **neatly cross out the initial answer** before writing the next one.

Instructions: Read the passages and answer the questions that follow:

I) There is this strong rumour going around that the world will end in 2012. One of the prime reasons is that scientists and mathematicians around the world have realized that the Mayan calendar ends that year, precisely on 21st December 2012. It is a well known fact that the Mayans were excellent at mathematics and taking this into account the present day scientific world is giving their calculations a lot of weight. Anyways talking about calendars, the present calendar in use is known as the Gregorian calendar. It was introduced by Pope Gregory XIII as a reformation to the Julian calendar in the year 1582.

Now suppose the mortals on Earth decide for a change in the calendar. A week consists of 10 days in the new calendar named One-day, Two-day, Three-day till Ten-day. Each month has 21 days barring the middle month which has 29 days (30 days for a leap year). The months are named in reverse alphabetical order starting from Z. This calendar is assumed to be adopted on January 1, 2000 and the day of adoption is a One-day. All statistics start afresh in the new calendar system. Also due to man's merciless actions on nature the Earth's revolution around the Sun now takes 365.33 days and this is taken into consideration only in the new calendar system.

Q1. If Bharath's birthday is in the month N and falls on a Six-day in 2013, what day of the week will his birthday fall on in 2038?
 a. Six-day   b. Nine –day   c. Ten-day   d. One-day

Q2.Suheil was born in the month Q, 2001 which was a Three-Day. He lived for exactly 95 years. How many New Years would he celebrate on a One-day?
a. Seven   b. Eight   c. Six   d. Nine

F1) Two mothers and two daughters were going shopping. They had 27 rupees, which they decided to divide between themselves such that each of them got a whole number of rupees. How many rupees did each get?

Q3.What day of the week and month (in the new calendar) would it be today July 18th, 2010 (according to Gregorian calendar)?
a. Nine-day, Month-Q   b. Nine-day, Month- S
c. Nine-day, Month –R   d. Two-day, Month-Q

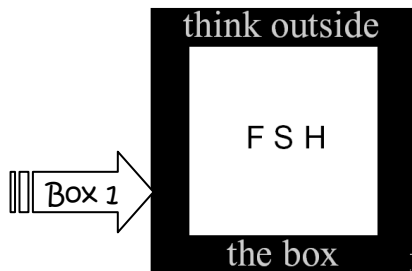Q4. Which of the above answers would change if the adoption date was changed to January 1st,2001?
 a) 1, 2, 3.b.   b) 1,2, 3.a
 c),2,3.a   d)1,3.a

Instructions: Read the passages and answer the questions that follow:
II) A group of people were found dead near a bench in a park. You are a detective and have been asked for help in the investigation. You cannot arrive on the scene, so all the data on their phones has been forwarded to you. You are also told the position of the bodies when they were found. You are NOT told the kind of wounds they have or if they even have any wounds.

1) As soon as you are told that they are forwarding the data from the phones to you, even before you get the data, you eliminate a motive for the attack. Which motive is that?

2) Which of these is least likely to be found out from the data on the phones?
    a. An approximation of the time of the attack.
    b. The identity of the murderer.
    c. Whether the murderer has attacked other people before
    d. The mode of killing (MAYBE)

3) Match the following positions of the bodies to the wounds that the bodies most likely have:

i. One person on the bench, the rest near the bench	a. No wound
ii. All people near the bench	b. Bullet wound
iii. All people on the bench	c. Knife wound

4) In which case is there most likely to be more than one attacker?
    a. One person on the bench, the rest near the bench
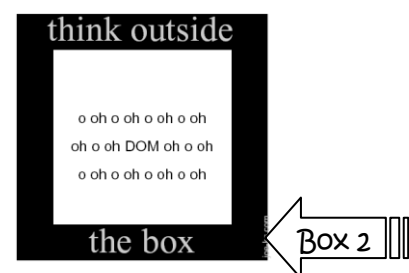   b. All people near the bench
    c. All people on the bench

Comprehension

Instructions: Read the passages and answer the questions that follow:

III) Six teams (A, B, C, D, E and F) competed against each other in a sports event. There were two stages in the event. Each team played three matches in Stage-I and two matches in Stage-II. No team played against the same team more than once in the event. Ties were not permitted in any of the matches. The observations after the completion of Stage-I and Stage-II are as given below.

Stage-I:

- One team won all the three matches.
- Two teams lost all the matches.
- D lost to A but won against C and F.
- E lost to B but won against C and F.
- B lost at least one match.
- F did not play against the top team of Stage-I

Stage-II:

- The leader of Stage-I lost the next two matches.
- Of the two teams at the bottom after Stage-I, one team won both matches, while the other lost both   matches.
- One more team lost both matches in Stage-II.

Q1. The team with the most wins in the entire event are :-

a. A

b. A & C

c. B

d. B & E

Q2. The two teams that defeated the leader of Stage - I

a. F &D

b. E & F

c. B & F

d. E & D

Q3. The only team(s) that won both the matches in Stage-II is (are):

a. B

b. E &F

c. B & F

d. B, E & F

> F2) A mute person goes into a shop to buy a toothbrush. He imitates the action of brushing his teeth to the shopkeeper, who understands him, and sells him the toothbrush. Next, a blind man goes into the same shop to buy a pair of sunglasses. How does he tell the shopkeeper what he wants?
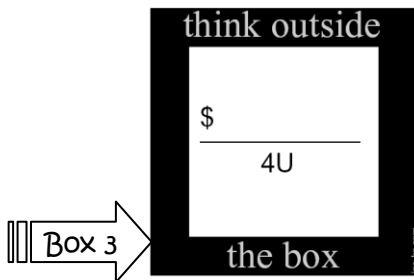
Play with Numbers

1) Let's go off to Egypt now (a bit back in time as well.) The great pharaoh, Ramses XI wants a great pyramid for him. The structure is to have a square base and must be solidly composed of cubical stone blocks. Each level of the pyramid contains one less block per side as the pyramid rises. He has an initial work force of 35,000 slaves (that's a lot!). Each morning the available labour pool is divided into work crews of 17 slaves each. Any remainder that cannot form a full crew gets the day off, much to the envy of other workers, but are available the following day. Each crew can lay one block of the pyramid each day. Unfortunately, the heat of the desert sun causes the death of one member of each crew each day. Work ceases on the project when it can be determined that there will be insufficient slaves available to raise the pyramid one more level. Each stone block measures 3 meters per side. How many days will it take to construct Ramses' pyramid? How tall will it be? How many of the original slaves survive the construction?

2) I was sitting around with my friend Samir and his grandfather last week, and the topic of birthday surprises came up(we generally talk crap).Dadaji mentioned that one of the greatest surprises that he has had involved his grandfather, who happens to have had the same birthday that Dadaji has. One year the family was celebrating this double birthday, and during the events Dadaji proudly mentioned to his grandfather that not only he had just turned as old as the last two digits of the year he was born in, but he was also a prime number of years old, and each of the two digits making up his age was also a prime. Understandably, Dadaji was floored when the older man thought for a second, turned to him, and said that the same thing had just happened to him! What year did this occur, and how old had Dadaji and his grandfather just turned? (Hint: Be realistic)

3) When Mayank turned x years old he noticed to his surprise (and mine as well) that between them x^2 and x^3 included all the digits from 0 to 9, with none repeated. How old was he?

think outside

$\dfrac{\$}{4U}$

Box 3

the box

4) Some people sat in a circle, so that each had two neighbours and each had a certain number of rupees. The first had one rupee more than the second, who had one rupee more than the third, and so on. The first gave one rupee to the second, who gave two rupees to the third, and so on, each giving one rupee more than he or she received, for as long as possible. There were then two neighbours, one of whom had four times as much as the other. How many people were there? How much had the poorest person at first?

5) Kunal, a rich business tycoon commutes weekly between Delhi and New York. Kunal's driver picks him up from the airport at Delhi .One day flight was proponed 1 hr before the scheduled time. So Kunal having arrived early at airport and not willing to waste his time decided to walk down to his home .In the way he met his driver and then his driver drove him back .In this process he saved 20 minutes, so guess how long Kunal was walking?

Comprehension

Your good friend Mark, the quintessential fitness freak, wants to walk from point A (top-left corner) to point B (bottom-right corner) in a square grid.

His net calorie gain for a path from A to B is calculated based on the following rules:
1.) There are many blueberry bushes along the path. Mark, who cannot resist blueberries, actually gains calories upon going to such squares! However, he loses calories in the rest of the squares. The number in each square of the grid represents the number of calories he gains upon travelling to that square from an adjacent square.
2.) He travels in steps of one along the shortest path, i.e. along the right and down directions only.

He seeks out your help in route selection for this fitness plan. For each of the following grids, help him to determine which paths are the best and worst for his plan to lose weight!

1) What is the maximum and minimum no of calories that he can gain by walking from A to B?

A	-1	3	6	0
-1	2	-1	-3	5
3	-1	5	3	-4
6	-3	3	2	-1
0	5	-4	-1	B

F4) What can you hold in your right hand, but not in your left?

Mark's friend John never cares about the path he takes, yet he doesn't seem to lose or gain any calories. John walks from his house on the top left corner of a 10-by-10 grid to his office at the bottom right corner of the grid in the morning and back in the evening. The numbers of calories he loses in each square of the grid is evenly spread between 10 and 20.
He eats 3 meals a day. His evening snack has one-third the amount of calories of a meal.
1) On an average, how many calories are there in one of John's meals?

CRYPTOGRAPHY

Instructions: These are a series of inter-connected questions. The answer of each question is a clue to the next question.

1) Let us define the alphabets as :

A=*****	B=****B	C=***B*	D=***BB	E=**B**	F=**B*B
G=**BB*	H=**BBB	I=*B***	J=*B**B	K=*B*B*	L=*B*BB
M=*BB**	N=*BB*B	O=*BBB*	P=*BBBB	Q=B****	R=B***B
S=B**B*	T=B**BB	U=B*B**	V=B*B*B	W=B*BB*	X=B*BBB
Y=BB***	Z=BB**B	blank=BBBBB			

Now crack the coded sentence given below grouping the letters into clusters of five, using **capital letter=B** and the definition of the letters given above (for example, A=*****)
SomEtimES, I would wATCH a mOvie that I watChED WHeN i waS YoUngeR AnD sUDdeNly ReaLIZe i Had nO idEa whAT waS gOING ON WHEN I FIRST SAW IT.

2) Use your observation skills and try to decipher the clue to the next question.

The clue to next question:

3) if the 26 atebahpls wree in a clcrie, tehn rcalpee ecah letter wtih its dllacirtemaiy otisoppe letter. tihs is craseas cehpir.   Use this code in the next question.

4) Jevgr gur svefg unys bs gur yrggref va svefg ebj naq gur erfg va gur frpbaq naq sbyybj "A". guvf vf a-pbqr.

5) vrerosursia?imgtepotitm!eehadfqaeprl?tihhlyuhsie

6)

U	S	E	C	E
R	A	N	D	A
E	D	E	N	S
H	O	C	--	A
P	I	C	S	R

7) byggr!apbuua

The above word is an anagram(an anagram is rearrangement of letters in a word or a group of   words. For example, an anagram of "the eyes" is "they see".) of your final destination.
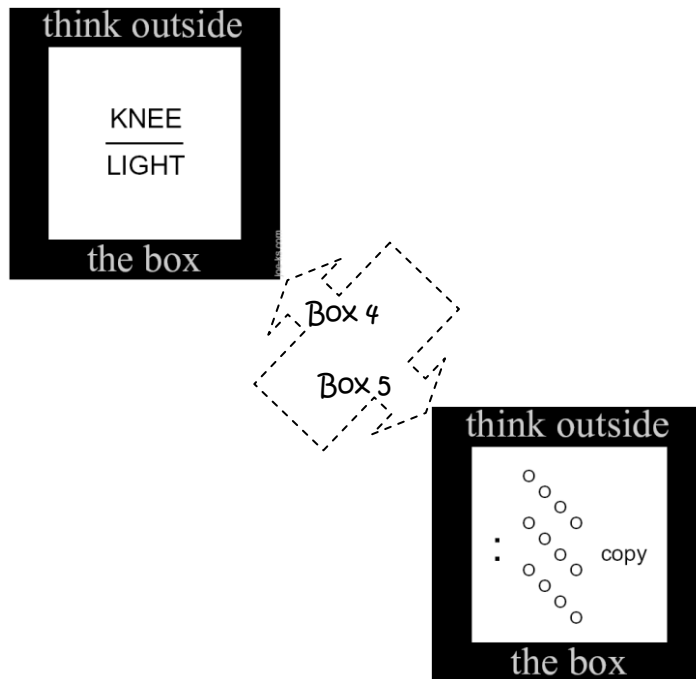
A R B I T+FUN

1) A rope ladder is hanging over the side of a ship. The ladder is 12 feet long; each rung is one foot apart. The tide rises at the rate of four inches per hour. How long will it take for the first 4 rungs to be underwater?

2) A man was sitting in a room, reading a book, when his wife entered the room and switched off the light. Although this occured at night, and the room was now pitch dark, the man continued reading as though nothing had happened. How could he do this?

3) How is it possible to arrange 12 matchsticks to give 6 squares (without breaking any, of course)?

4) A family X went for a vacation. Unfortunately it rained for 13 days when they were there. But whenever it rained in the mornings, they had clear afternoons and vice versa. In all they enjoyed 11 mornings and 12 afternoons. How many days did they stay there totally?

5) A man wanted to enter an exclusive club but did not know the password that was required. He waited by the door and listened. A club member knocked on the door and the doorman said, "twelve." The member replied, "Six" and was let in. A second member came to the door and the doorman said, "Six." The member replied, "Three" and was let in. The man thought he had heard enough and walked up to the door. The doorman said, "Ten" and the man replied, "five". But he was not let in. What should have he said?

think outside

KNEE
———
LIGHT

the box

Box 4

Box 5

think outside

copy

the box

6) Cathy has six pairs of black gloves and six pairs of brown gloves in her drawer. In complete darkness, how many gloves must she take from the drawer in order to be sure to get a pair that match? Think carefully!!

7) What would come next in the sequence?
   S30   O31   N30   ?

8) Rearrange these six matchsticks in two different ways to make "nothing." No matchsticks may be bent, broken, or placed over each other.
   1   1   1   1   1   1

9) As part of a rather odd driving challenge you are required to complete two laps of a racetrack at an overall average speed of 80mph. At the instant you finish the first lap; you are informed that your average speed over that first lap was only 40mph. How fast do you need to travel over the second lap to get your overall average speed up to the target value of 80mph?

10) Imagine that you live on the moon. One day you see a number 14 bus. What is the most likely number of bus routes on the moon?