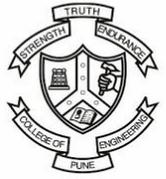# College of Engineering, Pune

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Genius Junior
Round 2

Time: 2 hours   **Max. Marks: 124**

Grade: 8th std

ANSWER KEY

Note : This Answer Key contains only one of the many correct answers to each question. Any suitable logically accurate answer is acceptable and marked correct.

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SECTION 1: RISK IT ALL!

*There will be **negative marking** in this section. Each incorrect answer will deduct one mark from your total score. However, if **all** the questions are answered correctly, marks obtained in the fourth section will get **DOUBLED**.*

| Section score: 13 |

1) In a 50 over international cricket match, considering no extras (no wide, no 'No' balls, etc.) and no overthrows.
What is the maximum number of runs that a batsman can score in an ideal case?

Note 1: Here we assume ideal and little practical scenario. We assume that batsman cannot run for more than 4 runs in a ball,

Note 2: The striker and the non-striker interchange positions after the last ball of an over. **[4]**

Answer: | 1653 |

Explanation: 6 on first 5 ball of each over, 3 on last ball, for 49 overs.
                        36 in the last over.

2) Birbal is a witty trader who trades a mystical fruit grown far in north. He travels from one place to another with three sacks which can hold 30 fruits each. None of the sack can hold more than 30 fruits. On his way, he has to pass through thirty checkpoints and at each checkpoint, he has to give one fruit for each sack to the authorities.

How many mystical fruits remain after he goes through all the thirty checkpoints such that he has maximum number of fruits in the end? **[3]**

Answer: | 25 |

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3) Rugved visits a sweet shop which has an unusual offer-you can get one toffee by exchanging 3 toffee wrappers. Rugved being lucky, has 150 toffee wrappers of previous toffees. Assuming Rugved is a smart child, how many toffees can he get?   **[4]**

Answer: 74

4) You are instructed to conduct an experiment as a part of your science project. You have to determine the highest floor of a 128 floored building from which an egg can be dropped without breaking. To conduct the experiment, what would be the minimum number of eggs you will require? **(Assume the egg doesn't get weakened due to the fall, it either breaks or remains intact)**   **[2]**

Hint: The answer is less than the number of fingers on your hand.

Answer: 1

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Section score: 12

SECTION 2: SIMPLETON

Nothing fancy here

5) One amoeba is placed in a bucket. The number of amoebae doubles every minute. If the bucket is full in 50 min. When was it half full? (In minutes)   **[3]**

Answer: | 49 |

6) A person left a 300,000-dollar bill on his desk and went outside for some work. When he returned the money was stolen. He has three suspects: the cook, the cleaning lady, and the mail guy. The cook says he put the money under a book on his desk to keep it safe. They check and it is no longer there. The maid says she moved it when she was cleaning the inside of the book between page 21 and 22. The mail guy says he saw it sticking out of the book and to keep it safe he moved it to between page number 52 and 53. Once they are done the culprit is promptly arrested. Who did it and how did the person know?

Hint: Check the page numbers of your question paper :)   **[4]**

Answer: The maid is the culprit because the page numbers 21 and 22 are located on opposite sides of the same sheet.

7) A bat and a ball together cost ₹500. If the bat is ₹490 more than the ball.
Find the cost of each.   **[2]**

Answer: Ball: | 5 | Bat: | 495 |

8) What digit is the most frequent between the numbers 1 to 100 (inclusive)? To solve this riddle, you don't want to manually do all of the math but rather try to figure out a pattern. **[3]**

Answer: 1

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SECTION 3: CONNECT THE DOTS

Section score: 13

Right answers to the first three questions will help you solve the last one!

9) Evaluate the following expression in which a, b, c…z are all variables.

(x-a)(x-b)(x-c).........(x-z)   **[2]**

Answer: **0**

10) You are about to leave for a holiday but you forgot your socks! You race back to your room, but the power is off so you can't see sock colours.

Never mind, because you remember that in your drawer there are 20 pairs of blue socks, and 24 pairs of black socks. But they are all mixed up.

What is the minimum number of socks you would need to take to be *assured* of a pair of same coloured socks?   **[3]**

Answer: 3

11) A snail is at the bottom of a 20 meters deep pit. Every day the snail climbs 5 meters upwards, but at night, it slides 4 meters back downwards.
 How many days does it take before the snail reaches the top of the pit?   **[2]**

Answer: 16

12) There is a unique number of ten digits, for which the following holds:
all digits from 0 up to 9 occur exactly once in the number;
the first digit is divisible by 1;
the number formed by the first two digits is divisible by 2;
the number formed by the first three digits is divisible by 3;
the number formed by the first four digits is divisible by 4;
the number formed by the first five digits is divisible by 5;
the number formed by the first six digits is divisible by 6;
the number formed by the first seven digits is divisible by 7;
the number formed by the first eight digits is divisible by 8;
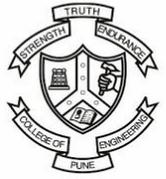the number formed by the first nine digits is divisible by 9.
the number formed by the first ten digits is divisible by 10.
The question: Which number is this?

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Hint: **Last** digit of the number is answer to the **9th** question.

       1st digit of the number is answer to the **10th** question.

       3rd and 4th digit of the number is Answer of **11th** question.   **[6]**

Number is: 3 8 1 6 5 4 7 2 9 0

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SECTION 4: THEORY-WISE

Just theory questions. Write your answers on the lines provided below the question.

Section score: 12

13) You have only two jars of capacity 12 litres and 5 litres and an unlimited supply of water. How can you pour exactly 9 litres of water into the 12 litre jar in minimum number of steps?

[3]

Answer: Fill the 12 litre jar with water. Pour 5 litres from it into the 5 litre jar. Empty the 5 litre jar. Now 7 litres of water remains in the 12 litre jar. Now, again pour water from the 12 litre jar into the 5 litre jar. Empty the jar again. Now 2 litres of water remains in the 12 litre jar. Pour this water into the 5 litres jar. The 5 litre jar now contains 2 litres of water. Fill the 12 litre jar again. Pour water from the 12 litre jar into the 5 lites jar. Only 3 litres of water can be filled in the 5 litre jar now. Therefore after completely filling the 5 litre jar, only 9 litres of water is left in the 12 litre jar.

14) Three men- Mr. Baker, Mr. Blacksmith and Mr. Driver- are a baker, a blacksmith and a driver, but their surnames do not necessarily correspond to their jobs. The driver, in any event, is not Mr. Baker, nor does Mr. Driver's name match his job; and the man who is the baker has a name that does not correspond to Mr. Blacksmith's occupation. Write the occupation of the three

[2]

Answer:

   Mr. Driver -   Blacksmith

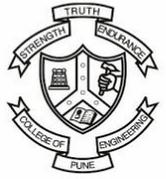   Mr. Blacksmith -   Driver

   Mr. Baker -   Baker

15) Alibaba was running from 40 thieves. Alibaba had only 3 unbreakable gold bricks which cannot be melted and weigh 4 kg, 2 kg, and 1 kg respectively. A witty man asked Alibaba to stay with him for seven days in exchange for 1 kg of gold per day. Alibaba needs to stay there for seven days and also does not want to give the witty man any advance.

How can Alibaba pay for his stay every day?

[3]

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Answer:

First Day : Give the 1 KG brick the witty man.
Second Day : Give the 2 KG brick to the witty man and take the 1 KG brick back.
Third Day : Give the 1 KG brick to the witty man again.
Fourth Day : Give the 4 KG brick and take the 1 KG and 2 KG bricks back
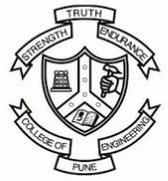Fifth Day : Give the 1 KG brick again.
Sixth Day : Give the 2 KG brick and take the 1 KG brick back.
Seventh Day : Give the 1 KG brick to the witty man.

16) A farmer is travelling with a fox, a sheep and a small stack of grass. He comes to a river with a small boat in it. The boat can only support the farmer and one other animal/item. If the farmer leaves the fox alone with the sheep, the fox will eat the sheep. And if the farmer leaves the sheep alone with the grass, the sheep will eat the grass.

How can the farmer get all three as well as himself safely across the river?   **[4]**

On his first trip, the farmer will take the sheep to the other side and leave the sheep on that shore. He will return to this shore alone. Then he will take the grass with him to the other shore and keep it there. While coming back, he will bring the sheep with him to this shore. Then he will travel with the fox and leave the sheep on this shore. After dropping the fox on the other shore, he will return alone and take the sheep with him to the other shore. (Any similar correct answer acceptable)

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TRICK OR TREAT'17

(SATRA PE KHATRA)

Are you ready to play the gamble?

Getting this question right will **double** your test score!

However, getting this question wrong will **halve** your test score!

This question will be evaluated only on attempting at least 3 questions in all the 4 sections.

17) There are 100 coins scattered in a dark room. 10 have tails facing up and 90 are facing heads up. You can't simply tell which coins are which. How can you arrange the coins into two piles such that both the piles contain the same number of tails up coins?

Make random sets of 90 and 10 coins each. Turn over all the coins in the set having 10 coins.

Reason:

Let the number of tails facing up coins in the first set(the set with 90 coins) be x. So, the number of tails facing up coins in the second set(the set with 10 coins) will be 10 - x. Now , after flipping the set 2, the number of tails facing up coins in the second set will be 10 - (10 - x) ie x.