General Instructions

(1)

The motive for enabling this mock SAMPLE test is to familiarize the candidates with the Computer Based Test (CBT) environment of the PGEE 2018, conducted by IIIT Hyderabad.

(2)

The types of questions and marking scheme is only illustrative and is in no way indicative or representation of the type of questions and marking scheme of the PGEE question paper.

(3)

The examination is spread over two sections, Section 1 (General Aptitude Questions) and Section 2 (Mathematics Questions). You cannot review your answers to Section 1 once you start answering Section 2.

Section 1
(General Aptitude)
Instructions

(1)

No candidate will be allowed to leave the hall till the end of the examination.

(2)

Pens, Pencils, Notes, books, log tables, Calculators, any programmable devices, communication devices, any other electronic devices are strictly prohibited in the examination center.

(3)

Rough sheets and pens will be provided in the examination center. A virtual on-screen calculator is avialable for use.

(4)

It is a computer based entrance test with multiple choice type questions.

(5)

No clarification will be provided during the examination.

(6)

Some questions may have more than one answer correct. Points will be given only when ALL the correct answers are marked and NONE of the incorrect are marked.

(1)

Three cards are chosen at random from a pack of 52 cards. In how many ways this can be done if all the three cards are of different types?

(A)

4×13^3

(B)

$13 \times 12 \times 11$

(C)

$^{53}C_{13}$

(D)

$(3 \times 13) / (12 \times 11)$

(2)

A certain stock of food items is sufficient for 40 men for 12 days. Assuming the eating capacity of all the men to be the same. Find how many days the food stock will last if an additional 15 men join the group?

(A)

$8\frac{8}{11}$

(B)

8.3

(C)

$7\frac{1}{2}$

(D)

$10\frac{1}{3}$

(3)

Three wheels making 60, 36 and 24 revolutions in a minute, start at a certain point in their circumference downwards. Find when they will again come together on the same position.

(A)
    in 6 seconds

(B)
    in 5 seconds

(C)
    in 10 seconds

(D)
    Never

(4)

The difference between compound interest and simple interest on a certain amount of money at 5% per annum for 2 years is Rs. 15. Find the principal sum.

(A)
    Rs. 4500

(B)
    Rs. 7500

(C)
    Rs. 5000

(D)
    Rs. 6000

(5)

All shirts are T-shirts with buttons.
No yellow T-shirt has buttons.
No shirt is yellow.
If the first two statements are true, the third statement is

 (A)
    True
 (B)
    False
 (C)
    Uncertain

(6)

The hotel is two blocks east of the drugstore.
The market is one block west of the hotel.
The drugstore is west of the market.
If the first two statements are true, the third statement is

 (A)
    True
 (B)
    False
 (C)
    Uncertain

(7)

In comparison to the standard typewriter keyboard, the ABC keyboard, which places the most-used keys nearest the typist's strongest fingers, allows faster typing and results in less fatigue. Therefore, replacement of standard keyboards with the ABC keyboard will result in an immediate reduction of typing costs.

Which of the following, if true, would most weaken the conclusion drawn above?

(A)

People who use both standard and ABC keyboards report greater difficulty in the transition from the ABC keyboard to the standard keyboard than in the transition from the standard keyboard to the ABC keyboard.

(B)

ABC keyboards are no more expensive to manufacture than the standard keyboards and require less frequent repair than the standard keyboards.

(C)

Novice typists can learn to use the ABC keyboard in about the same amount of time that it takes them to learn to use the standard keyboard.

(D)

The number of businesses and government agencies that use ABC keyboards is increasing each year.

(E)

The more training and experience an employee has had with the standard keyboard, the more costly it is to train that employee to use the ABC keyboard.

(8)

In Asia, where palm trees are non-native, their flowers have traditionally been pollinated by hand, which has kept palm fruit productivity unnaturally low. When weevils known to be efficient pollinators of palm flowers were introduced into Asia in 1980, palm fruit productivity increased-by up to 50 percent in some areas-but then decreased sharply in 1984.

Which of the following statements, if true, would best explain the 1984 decrease in productivity?

(A)

Rapid increases in productivity tend to deplete trees of nutrients needed for the development of the fruit-producing female flowers.

(B)

Prices for palm fruit fell between 1980 and 1984 following the rise in production and a concurrent fall in demand.

(C)

Imported trees are often more productive than native trees because the imported ones have left behind their pests in their native lands.

(D)

The weevil population in Asia remained at approximately the same level between 1980 and 1984.

(E)

Prior to 1984 another species of insect pollinated the Asian palm trees, but not as efficiently the species of weevil that was introduced in 1980.

Read the paragraphs below to answer the following two questions.

The test that Henrich introduced to the Machiguenga was called the ultimatum game. The rules are simple: in each game there are two players who remain anonymous to each other. The first player is given an amount of money, say $100, and told that he has to offer some of the cash, in an amount of his choosing, to the other subject. The second player can accept or refuse the split. But there's a hitch: players know that if the recipient refuses the offer, both leave empty-handed. North Americans, who are the most common subjects for such experiments, usually offer a 50-50 split when on the giving end. When on the receiving end, they show an eagerness to punish the other player for uneven splits at their own expense. In short, Americans show the tendency to be equitable with strangers and to punish those who are not.

Among the Machiguenga, word quickly spread of the young, square-jawed visitor from America giving away money. The stakes Henrich used in the game with the Machiguenga were not insubstantial– roughly equivalent to the few days' wages they sometimes earned from episodic work with logging or oil companies. So Henrich had no problem finding volunteers. What he had great difficulty with, however, was explaining the rules, as the game struck the Machiguenga as deeply odd.

When he began to run the game it became immediately clear that Machiguengan behavior was dramatically different from that of the average North American. To begin with, the offers from the first player were much lower. In addition, when on the receiving end of the game, the Machiguenga rarely refused even the lowest possible amount. "It just seemed ridiculous to the Machiguenga that you would reject an offer of free money," says Henrich. "They just didn't understand why anyone would sacrifice money to punish someone who had the good luck of getting to play the other role in the game."

(9)

From the above passage, what can you conclude about who is Henrich?

(A)
　　Henrich is a social scientist studying human psychology.

(B)
　　Henrich is a volunteer from North America distributing money.

(C)
　　Henrich is movie director who is doing
　　a film on the Machiguenga people.

(D)
　　Henrich is a businessman working with oil and logging companies and exploit-
　　ing the Machiguenga people.

(E)　None of the above.

(10)

Which of the following best describes the objective of the game that Henrich introduced:

(A)

To see if Americans are more rational than the Machiguenga people.

(B)

To see if the Machiguenga people are more rational than North Americans.

(C)

To compare social and economic behaviour between different cultural groups.

(D)

To verify whether money is a factor in the cohesion of a community.

(E)

None of the above.

Section 2
(Mathematics)
Instructions

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1.

Let G be the set of all 2×2 matrices $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ where a, b, c, d are integers modulo two, such that $ad - bc \neq 0$. Using matrix multiplication as the operation in G, which of the following statements is true.

(A) G has order two

(B) G has order six

(C) G has order three

(D) G has order four

2.

Let G be a group in which for some integer $n > 1$, $(ab)^n = a^n b^n$ for all $a, b \in G$. Identify the valid statement.

(A) Both $G^n = \{x^n | x \in G\}$ and $G^{n-1} = \{x^{n-1} | x \in G\}$ are normal subgroups

(B) Both G^n and G^{n-1} are not subgroups

(C) G^n is a normal subgroup but G^{n-1} is not

(D) G^{n-1} is a normal subgroup but G^n is not

3.

Consider the function f defined by

$$f(x) = x - [x]$$

where x is a positive variable and $[x]$ is denotes the integral part of x. Is the function periodic? If it is, its period T is

(A) $T = 2$

(B) The function is not periodic

(C) $T = 1$

(D) $T = 3$

4.

Let

$$f\left(\frac{x_1 + x_2 + \cdots + x_n}{n}\right) = \frac{f(x_1) + f(x_2) + \cdots + f(x_n)}{n}$$

where all $x_j \in \mathbb{R}$ are independent with respect to each other and $n \in N$. If $f(x)$ is differentiable and $f'(0) = a$, $f(0) = b$ then $f'(x)$ is equal to

(A) a

(B) 0

(C) b

(D) $a + b$

5.

An inverted conical tank of radius $2m$ and height $4m$ is initially full of water has an outlet at the bottom. The outlet is open at some instant. The rate of flow through the outlet at any time t is $6h^{3/2}$ where h is the height of the water level above the outlet at time t. Then the time it takes to empty the the tank is

(A) $\frac{2\pi}{9}$ units

(B) $\frac{\pi}{9}$ units

(C) $\frac{\pi}{4}$ units

(D) $\frac{\pi}{2}$ units