UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO
UNIDADE ACADÊMICA DE BELO JARDIM

PROVA DE SUFICIÊNCIA EM LÍNGUA INGLESA

Nome completo: _____

Curso: _____ Data:_____/_____/_____

Que componente curricular você pretende dispensar?
( ) Apenas Inglês 1 ( ) Apenas Inglês 2 ( ) Inglês 1 e 2

Utilizando as técnicas de leitura instrumental abordadas na disciplina Inglês I, leia atentamente o texto abaixo e responda as questões que seguem após o texto.

NOTA

Why symmetry is so fundamental to our understanding of the universe.

You might remember learning about symmetry at school. Maybe a teacher showed you a snowflake's six-fold symmetry and you marveled at how it looked the same no matter how you rotated it. Well, it turns out that the wonders of symmetry go a whole lot deeper – as any mathematician who has studied **it** will tell you.

"Instead of being something visual, which is what I responded to as a child, it became something much more abstract and linguistic in nature," says Marcus du Sautoy, a mathematician at the University of Oxford. "The understanding of symmetry I have now is so much deeper and stranger, and it gives me access to symmetries that are so much more exotic than anything you can see with your eyes."

For mathematicians, a symmetry is a type of invariance – when something remains unchanged under some kind of transformation, such as flipping **it** or rotating **it**. That sounds simple enough, but, as du Sautoy suggests, most symmetries go beyond what is obvious to a casual observer.

Consider antimatter, which is what you get when positively charged particles become negative and vice versa. If no significant effects occur, then the system involved has charge symmetry. The laws of physics as we understand **them** suggest that the very early universe should have had equal amounts of matter and antimatter and then immediately annihilated itself. The fact that this didn't happen means there was no charge symmetry in the newborn universe – understanding why is one of the biggest tasks in physics.

Matter's symmetries aren't just a laundry list of things that are invariant under some change, **however**. **They** can relate to each other in ways that produce new symmetries. "There is a series of well-studied particle models whose symmetries live one inside the other, like a set of **Russian dolls**," says Nichol Furey at Humboldt University of Berlin. "Symmetries themselves can have symmetries!"

The explanatory power of symmetry

This richness reflects the importance of the concept in physics. Symmetry has proven particularly useful in developing theories because it is usually an indication that something can be simplified.

That is how we built the standard model of particle physics, which makes sense of matter and its workings. We defined its symmetries and the identity of all the particles it contains. Everything else, such as the dynamics and interactions of all the particles, can be derived from this, says Jonas Lindert at the University of Sussex, UK. "Symmetry is absolutely fundamental to particle physics."

Physicists are especially interested in symmetries that disappear or “break”. The existence of the quark was predicted thanks to an observation of broken symmetry. And the search for the Higgs boson was motivated by the need to break a symmetry of the early universe in order to account for the mass of the W and Z bosons.

All of which raises the question: why is symmetry so vital to the universe? Du Sautoy thinks it is an indication of the fundamental role mathematics plays in reality. “My belief is that what we see around us is a physicalised piece of mathematics,” he says.

Whether that is true or not is another debate entirely. But Lindert is confident that symmetry is going to be key to future discoveries in physics. “Symmetry will always be absolutely fundamental in any new theory of nature,” he says.

On that point, Sabine Hossenfelder at the Frankfurt Institute for Advanced Studies in Germany, is more circumspect. Ancient symmetry-centric notions that the planets’ orbits should be circular and modern ideas of supersymmetry, where each known particle should have a hidden partner, haven’t stood up to scrutiny. “Symmetry is sometimes misleading,” she says.

(BROOKS, M. *New Scientist*, 10 de maio de 2023)

Perguntas

1. No primeiro parágrafo, o articulista nos diz de uma qualidade deslumbrante de um floco de neve. Qual é essa qualidade?

   _____

   _____

2. Ainda no primeiro parágrafo, diga o que o autor nos revela sobre a complexidade da simetria.

   _____

   _____

3. No segundo parágrafo, o autor nos diz que a simetria era algo visual quando ele era criança. Como ele vê esse fenômeno como pesquisador?

   _____

   _____

4. No quarto parágrafo, após a linha 17, o autor nos confronta com um paradoxo da física. Conte com suas palavras qual é esse fenômeno.

   _____

   _____

5. Ainda no início do 4º parágrafo, existe um grupo nominal formado por 3 palavras, qual é ele e como você o traduziria?

   _____

   _____

6. Identifique os antecedentes dos seguintes pronomes:

a. **It** (linha 6) _____
b. **It** e **it** (linha 13) _____
c. **Them** (linha 18) _____
d. **They** (linha 23) _____

7. Entre as linhas 5 e 20 existem algumas estruturas linguísticas que funcionam como graus dos adjetivos ou advérbios. Transcreva-as abaixo.

_____

_____

8. O conector lógico **however**, na linha 23, insere qual tipo de relação à oração?
a. Alternativa
b. Condição
c. Contraste
d. Consequência
e. Tempo

9. Qual o fenômeno físico que o autor compara com bonecas russas? (**Russian dolls** – linha 25).

_____

_____

10. Na palavra "*richness*" (linha 29), foi adicionada o sufixo -***ness*** ao adjetivo "*rich*" para formar um substantivo. Indique a alternativa que o mesmo sufixo pode ser adicionado para formar substantivos.
    a. rude, kind, curious
    b. red, happy, good
    c. friend, soft, ill
    d. dark, similar, aware

INGLÊS 2

NOTA

11. Indique o núcleo dos grupos nominais abaixo e classifique-os em simples ou complexos:

I. A casual observer
   a. casual – complexo
   b. casual – simples
   c. observer – complexo
   d. observer – simples

II. The laws of physics
   a. laws – complexo
   b. laws – simples
   c. physics – complexo
   d. physics - simples

III. Modern ideas of simmetry
   a. modern – complexo
   b. ideas – complexo
   c. ideas – simples
   d. symmetry - simples

IV. Any new theory of nature
   a. any – complexo
   b. new – complexo
   c. theory – complexo
   d. nature – complexo

12. No trecho "*Symmetries themselves can have symmetries!*" o verbo modal ***can*** indica:
a. Obrigação
b. Possibilidade
c. Habilidade
d. Sugestão

13. Selecione o trecho no qual ocorre a mesma forma verbal que o trecho: *The existence of the quark was predicted thanks to an observation*.
a. Symmetry is absolutely fundamental to particle physics.

b. Symmetry has proven particularly useful in developing theories.
c. Physicists are especially interested in symmetries that disappear or “break”.
d. Symmetry is going to be key to future discoveries in physics.

14. No trecho “*Sabine Hossenfelder at the Frankfurt Institute for Advanced Studies in Germany, is more circumspect*”, o adjetivo ***circumspect*** pode ser substituído por:
a. cautious
b. certain
c. positive
d. believing

Utilizando as estratégias de compreensão auditiva, assista ao vídeo “*Does time exist?*” e responda as questões abaixo.

15. One of the earliest ways of measuring time is:
a. change of seasons
b. hourglass
c. mechanical clocks
d. sundials

16. The Arrow-of-time concept says that in our universe…:
a. Time flows the same rate everywhere.
b. Time cannot be measured.
c. Time cannot go backwards.
d. We can move to any direction through time.

17. The scientific concept that measures the behavior of the smallest particles in our universe is:
a. Relativity
b. The arrow-of-time
c. Entropy
d. Quantum physics

18. The Wheeler DeWitt’s theory…:
a. Studies the fundamental properties of the universe.
b. Excludes time of the equation.
c. States that time does not exist.
d. Says that time is only an illusion generated by the way we perceive the universe.

19. Emergent properties are...
a. individual pieces of a system
b. individual water molecules that form waves
c. properties that appear as a result of interactions between other components.
d. properties that only exist in individual pieces of a system.

20. Escute a primeira frase do vídeo novamente e selecione a opção que contém **stressed words** (palavras que são pronunciadas com mais destaque no discurso).
a. the, measurements, cycles, world.
b. earliest,measurements, cycles, world.
c. Time, observations, were, natural.
d. earliest, measurements, of, cycles.

Source: TED-Ed. **Does time exist?** YouTube, 23 de out. de 2018.