READING PASSAGE 3

*You should spend about 20 minutes on **Questions 27-40**, which are based on Reading Passage 3 below.*

Science and Filmmaking

Academics are now working more with filmmakers who are impressed by the results of their research in computer-generated imagery (CGI)

Every year the film academy in the USA celebrates the outstanding achievements of the year in a ceremony known as the Oscars. An increasingly important component of the ceremony is the presentation of the Scientific and Technical awards. In 2004 a notable event took place: the academic world met the cinematographic world when researchers from Stanford University in the USA were awarded an Oscar. These researchers, led by Steve Marschner, were from the field of Computer Graphics at Stanford. They were part of a growing cohort of computer scientists that has become fundamental to moviemaking.

Films have shown that it is possible to use CGI to make actors look younger, older, weaker or stronger than they actually are in a surprisingly realistic manner. At least, it is possible if the altered actors are not filmed too closely. This is because the difficulty of recreating the textures of both skin and fabric means that the effect is less convincing when seen close up. The work of Marschner and his colleagues has greatly improved the accurate and realistic modeling of both skin and fabric. They recognized that one of the difficulties of creating lifelike characters in the computer world is that, in CGI, the characters' skin is opaque (two-dimensional) whereas real skin is in fact translucent (three-dimensional), that is to say, it is semi-transparent.

Marschner and his colleagues received the Oscar for their work in successfully producing a CGI model that simulates translucency; this is when light penetrates skin and then scatters below the skin's surface before re-emerging. This is called subsurface scattering, and the mathematics for the model goes back many decades to the time when it was used in astrophysics. Because human skin is naturally translucent, it was necessary to be able to create this artificially in order to simulate the soft appearance of real skin. Previous CGI models, which assumed that skin was entirely opaque, resulted in characters with a plastic appearance. The scientists' new model of CGI was so important in bringing digital characters to life that, within two years of their original research paper, all the major special-effects studios had incorporated it into their digital rendering systems.

However, despite their award, the scientists, with admirable tenacity, continued their search for perfection, as they still did not feel that they had yet satisfactorily recreated the subtle ways light is reflected. To do this, they began to look in detail at the way skins and fabrics reflect light differently according to their make-up: the exact arrangement of fibers in fabric and the network of fibers in skin. Marschner and his team tried to do this by using computerized tomography, which is most familiar as a medical technique for examining people's internal organs. Like classical radiology, it uses X-rays, but because the image is constructed inside a computer using exposures taken from many different positions, rather than a single exposure on photographic film, it can capture fine details that are invisible in classical radiography.

Unfortunately, the scientists understood that at this point in time they could not use computerized tomography on skin, because a very high-intensity X-ray is needed to show the kind of detail they wanted and this would be very dangerous for human skin. They have, however, had some success with fabric. Using this new method of imaging, they are able to accurately record the three-dimensional structure of all the fibers in a number of small pieces of fabric. These same pieces of fabric, through the use of CGI, can then be patched together to form an entire garment inside a computer, in the same way that a small group of actors can be made to look like hundreds of people gathered together. A garment created through CGI is therefore made up of pieces of fabric whose internal structure has been pre-recorded. This means that the way light is reflected by the garment can be calculated far more realistically than if the scientists just made a computer model of what they thought the interior of the fabric looked like. Cinematography will benefit from this because, although it may take some years to be able to use computerized tomographic imaging of skin, for the moment the movement of a virtual cloak or the lifting of a computerized hat should look far more realistic.

In the meantime, according to Marschner's colleague Kavita Bala, the technology might have an application in online retailing. At the moment, people buying clothes over the internet have only a standard photograph to help them choose their purchases. It is hoped that if online shoppers can view items which have been presented through the use of computerized tomography graphics, they will have a much better understanding of what the material the item is made of is really like.

Marschner is now working on the way light is scattered from individual hairs. He says, 'I feel lucky to be working in this niche. I'm a visual person and to be able to spend my time scrutinizing the world around me, trying to understand why it looks the way it does, is very rewarding'.

Questions 27–32

Choose the correct letter, ***A, B, C,*** *or* ***D****.*

Write the correct letter in boxes 27–32 on your answer sheet.

27 What is the writer's main point in the first paragraph?

- **A** Computer scientists are rarely represented at the Oscars.
- **B** Film-industry awards hold little interest for computer scientists.
- **C** The USA rewards film actors more than computer scientists.
- **D** Computer scientists are becoming a vital part of the film industry.

28 When describing the way computer-generated imagery changes actors' appearance, what does the writer suggest?

- **A** CGI looks best from a distance.
- **B** CGI interferes with actors' facial expressions.
- **C** Audiences expect too much of CGI.
- **D** The scientists had hoped for more convincing results.

29 What does the writer suggest about the scientists' attitude to their work in the fourth paragraph?

- **A** They were motivated to get as near to reality as possible.
- **B** They were interested in gaining recognition for their work.
- **C** They thought it could have medical applications.
- **D** They hoped to receive further funding for their research.

30 What are we told about computerised tomography?

- **A** It has only recently been used by doctors.
- **B** It is similar to X-rays in the way it works.
- **C** Filmmakers have used it for many years for special lighting effects.
- **D** It can be administered using traditional radiography machines.

31 Which of these advantages does the writer attribute to the current use of computerised tomography?

- **A** It is most effective when used to create images of skin.
- **B** It can make a few people seem like a crowd.
- **C** It allows clothes designers to create new designs.
- **D** It is practical because of the time it takes.

32 The writer mentions Kavita Bala in order to

- **A** comment on the success of CGI in commercial contexts.
- **B** highlight the link between CGI and photography.
- **C** show that Marschner's team are uncertain about the future of CGI.
- **D** demonstrate a use for CGI outside the film industry.

Questions 33–36

Do the following statements agree with the views of the writer in Reading Passage 3?

In boxes 33–36 on your answer sheet, write

YES	*if the statement agrees with the views of the writer*
NO	*if the statement contradicts the views of the writer*
NOT GIVEN	*if it is impossible to say what the writer thinks about this*

33 It used to be unusual for university researchers to receive a cinematography award.

34 CGI is popular among ageing actors.

35 The scientists' success in generating images of complete CGI garments has won them many awards.

36 It will be a long time before computerised tomographic *imaging of fabric* is used by filmmakers.

Questions 37–40

*Complete the summary using the list of words, **A–I**, below.*

*Write the correct letter, **A–I**, in boxes 37–40 on your answer sheet.*

The work of Marschner and his colleagues

For many years, CGI characters did not appear entirely lifelike as their skin appeared plastic. Marschner and his colleagues were the first to apply an understanding of how **37** _____ interacts with human skin. Their CGI model is based on a novel application of principles of **38** _____, which had previously been applied in other scientific research. The importance of CGI to the film industry has led to the **39** _____ of Marschner's model by special-effects studios. Marschner's model has led to the **40** _____ of cinematography.

A light	**B** transparency	**C** age
D use	**E** astrophysics	**F** mathematics
G improvement	**H** colour	**I** translucency

选择题（27–32）

题号	答案	题干翻译	精确定位句（英文）	定位句翻译	详细解释
27	**D**	第1段作者的中心观点是什么？	“They were part of a growing cohort of **computer scientists that has become fundamental to moviemaking**.”	“他们属于一个不断壮大的计算机科学家群体，**这个群体已成为电影制作的基础**。”	第1段先交代奥斯卡的科技奖，再说斯坦福团队获奖，最后点题：计算机科学家已成为电影产业的**关键组成**。A/B/C 都与段旨不符，只有 D 概括了“地位日益重要/至关重要”。
28	**A**	描述 CGI 改变演员外貌时，作者暗示了什么？	“At least, it is possible **if the altered actors are not filmed too closely**… the effect is **less convincing when seen close up**.”	“至少在**不把变造后的演员拍得太近**的情况下是可行的……**近景观看时**效果**不那么逼真**。”	这说明**远距离更好看**，故选 A。B“影响表情”文中无据；C“观众期望太高”未提；D“科学家期望更有说服力”并非本段主旨。
29	**A**	第 4 段作者暗示这些科学家对工作的态度是什么？	“**Despite their award**, the scientists… **continued their search for perfection**, as they **did not feel** that they had yet satisfactorily recreated the subtle ways light is reflected.”	“**尽管获奖**，科学家们……**继续追求完美**，因为他们**认为**尚未令人满意地再现光的微妙反射方式。”	体现的是**力求逼真、接近现实**的动机（A）。B“谋求名声”、D“寻求经费”均未提；C“医学应用兴趣”不是该段态度主旨。
30	**B**	文中关于“计算机断层扫描（CT）”说了什么？	“Like **classical radiology, it uses X-rays**, but because the image is constructed inside a computer…”	“与**传统放射学一样，它使用 X 射线**；但它的成像是在计算机内构建的……”	关键信息是**用 X 射线**，与“X 光片/放射学”有相似之处，故选 B。A“刚被医生使用”、C“电影人多年用于打光”、D“可用传统放射设备实施”均与原文不符。
31	**B**	作者把哪项优势归于当前 CT 的用途？	“…pieces of fabric… **can then be patched together to form an entire garment inside a computer, in the same way that a small group of actors can be made to look like hundreds** of people gathered together.”	“……这些小块织物**可以在计算机里拼接**成一整件服装，**就像可以把一小群演员做成看起来像几百人聚集在一起**。”	这里把**当前能做的**优势比喻为“把少数变成多数”，与选项 B 完全对应。A“最适合做皮肤”相反；C“帮助设计新款”未提；D“因为用时而实用”无据。
32	**D**	作者提到 Kavita Bala 是为了什么？	“the technology might have an **application in online retailing**… online shoppers… will have a much better understanding of what the material… is really like.”	“这项技术**可能用于网络零售**……网购者将**更好地理解**材料的真实质感。”	这是**电影之外**的应用示例，故选 D。A“商业成功”、B“与摄影的联系”、C“团队对前景不确定”都不是作者提 Bala 的目的。

判断题（33–36）— YES/NO/NOT GIVEN

题号	答案	题干翻译	精确定位句（英文）	定位句翻译	详细解释
33	**YES**	过去大学研究者获得电影类大奖并不常见。	“In **2004 a notable event** took place: **the academic world met the cinematographic world** when researchers from Stanford… **were awarded an Oscar**.”	“**2004 年发生了一件引人注目的事情：学术界与电影界相遇**——斯坦福的研究人员**获得了奥斯卡**。”	“notable event（不同寻常）+ 两界相遇”暗示此前罕见，故为 YES。
34	**NOT GIVEN**	CGI 在年长演员中很受欢迎。	“Films have shown… make actors look **younger or older**…”	“电影表明……可以让演员看起来**更年轻或更年长**……”	文中只说**能做到**，未评价年长演员**是否喜欢/是否流行**，故 NG。
35	**NOT GIVEN**	科学家用完整 CGI 服装成像的成功为他们赢得了许多奖项。	（关于织物的段落没有任何“获奖”措辞）	—	文中只说用于记录面料结构、提升真实度，**从未提到因此获奖**，故 NG。
36	**NO**	电影人使用织物 CT 成像还要等很久。	“…**may take some years** to be able to use computerized tomographic imaging of **skin**; **for the moment** the movement of a virtual cloak… **should look far more realistic**.”	“……要把 CT 成像用于**皮肤**可能还需要几年；**就目前而言**，虚拟斗篷的运动……**应当更逼真**。”	“要等几年”的对象是**皮肤**；而织物的 CT 数据**当前已能**让衣物动作更逼真。命题把 **fabric** 张冠李戴，故为 NO。

概要填空（37–40）

题号	答案	题干翻译	精确定位句（原文）	定位句翻译	详细解释
37	**A light**	Marschner 团队率先把“**37 _____ 与人类皮肤如何相互作用**”的理解用于 CGI。	“this is **when light penetrates skin and then scatters below the skin's surface** before re-emerging.”	“这指的是**光线穿透**皮肤后在皮下**发生散射**，再从皮肤表面重新射出的过程。”	概要句里的“interacts with human skin（与皮肤相互作用）”对应原文对光在皮肤中的穿透与散射过程的解释；因此应填 **light**。选 **translucency** 或 **transparency** 都不合语义——“半透明/透明”不是“与皮肤相互作用”的主体。
38	**F mathematics**	他们的模型基于对 **38 _____** 原理的全新应用，而这些原理先前已用于其他科学研究。	“This is called subsurface scattering, **and the mathematics for the model goes back many decades to the time when it was used in astrophysics**.”	“这被称为次表面散射，**而该模型所用的数学**可追溯到**曾用于天体物理学**的年代。”	先前被用于“其他科学研究”的是**这套数学原理**，被应用的领域是**天体物理学**。因此填“principles of **mathematics**… previously … in astrophysics”。若填 **astrophysics**，就变成“天体物理学的原理先前用于其他研究”，与原文逻辑相反。
39	**D use**	CGI 对电影业的重要性已导致特效工作室对该模型的 **39 _____**。	“…**within two years** of their original research paper, **all the major special-effects studios had incorporated it into their digital rendering systems**.”	“在论文发表**两年内，所有主要特效工作室都把它并入**自己的数字渲染系统。”	“incorporate into / 并入、采用” ≈ **use/使用**（或“采用 adoption”之意）。题库选项里与之语义等价的仅 **use**。
40	**G improvement**	该模型已带来了电影摄影的 **40 _____**。	“**Cinematography will benefit from this** because … the movement of a virtual cloak… **should look far more realistic**.”	“**电影摄影将因此受益**，因为……（虚拟服装等）**看起来会真实得多**。”	“will benefit from” → “带来**改进/提升**”。语义对应 **improvement**。其它如 **colour / translucency** 与“电影摄影整体”不匹配。