READING PASSAGE 3

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

The Long Road to Artificial Intelligence

In 1950, the computing pioneer Alan Turing published a paper in the journal *Mind* entitled 'Computing Machinery and Intelligence'. It was the first serious, scholarly treatment of the concept of Artificial Intelligence (AI). Turing predicted that by the year 2000 the majority of people would be able to speak of machines thinking without expecting to be contradicted, envisaging a world very different from the one he lived in.

Despite Turing's prediction, human-level artificial intelligence had not been achieved by the year 2000. Nevertheless, one significant milestone in artificial intelligence had recently been attained. In 1997 Deep Blue, a computer developed by IBM, defeated the world chess champion Garry Kasparov. Kasparov had beaten previous computer chess programs, which to him seemed predictable and mechanical, but he allegedly said he sensed an 'alien intelligence' on the other side of the board when he played against Deep Blue.

It is instructive to stand back and ponder this moment in the history of AI. The field had accomplished something that half a century beforehand might have been considered its crowning achievement. Humanity had been outstripped by a machine. Of course, a car can move faster than the fastest human sprinter, and a crane can carry far more than a champion weight-lifter. But intellectual prowess is what sets human beings apart from the rest of the animals, and chess is a supremely intellectual pursuit.

Yet somehow we seemed no nearer to human-level AI than in Turing's time. How could this be? The problem with Deep Blue was that it was a specialist. All it could do was play chess. Contrast this with a typical human adult. Take the office worker who has just walked past the window of the café where I am sitting with my laptop. Her day has no doubt been a busy patchwork of activities - making a packed lunch, reviewing the children's homework, driving to work, composing emails, fixing the photocopier, and so on. Each of these activities requires the exercise of multiple sensorimotor skills. Consider the task of making a packed lunch. This involves retrieving utensils and ingredients from various places, opening packets, chopping, cutting, spreading, and so on.

In short, a human being is a generalist. A human chess champion can do a whole lot more than just play chess. Moreover a human being is adaptive. Fixing photocopiers is not an innate capability. It is learned. Had the office worker been born in a different century or a different culture, she would have acquired a different set of skills. And if she has the misfortune to lose her present job, she can re-train for another one. The achievements of AI research in a variety of specialist domains (chess being just one among many success stories) contrast starkly with the field's failure to produce a machine with general purpose,

adaptive intelligence. So our basic question is, how could we produce artificial general intelligence?

An essential feature of biological intelligence is embodiment. Unlike Deep Blue, a human being is an animal with a body, and its brain is part of that body. The brain of an animal has evolved to prevent any harm from coming to that body and to perpetuate the genes that it carries. The body has muscles, enabling it to move, and senses, so that its actions can be made to react to the state of the environment, the better to achieve its goal. The brain shapes the animal's actions according to what it perceives. Human intelligence, for all its glorious achievements, is fundamentally an extension of animal intelligence, and the human capacities for language, reason, and creativity all rest on a sensorimotor foundation.

So while the endeavor to create artificial general intelligence might succeed without much that is essential to biological life, such as metabolism and reproduction, perhaps embodiment is a methodological necessity. Perhaps the need to engage with a messy, dynamic, physical environment full of complex and varied objects, both animate and inanimate, is at the root of intelligence. The only way to form a reliable judgment of the intelligence of an artifact is to observe its behavior in an environment like our own. And the only way to achieve human-level AI, according to this way of thinking, is through robotics. Our basic question can then be reformulated: How can we endow a robot with general intelligence?

One possibility is that general intelligence is simply the sum of many specialist sensorimotor skills, and up to now, AI hasn't replicated enough of them. So when robots have been given a certain critical mass of skills, general intelligence will somehow emerge. But even if we gloss over the many engineering questions this proposal begs, it remains unconvincing. The products of such an approach might briefly give the appearance of general intelligence. But nobody would be fooled for very long. The multi-specialist robot is going to get stuck as soon as it has to face a problem that is outside its areas of expertise, an inevitable occurrence in an ever-changing world.

Perhaps the capacity to learn is enough to plug the gap here. In an unfamiliar situation, a new skill can be learned. Indeed, learning in its various forms is the backdrop to all intelligence. But learning is time-consuming and risky. The hallmark of general intelligence in a robot is therefore the ability to adapt an existing set of behaviors to new challenges, and to do so without recourse to trial and error or to training by a third party. Only when that can be achieved will artificial intelligence truly match human intelligence.

Questions 27–30

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

*Write the correct letter, **A–D**, in boxes 27–30 on your answer sheet.*

27 When playing chess against the computer Deep Blue, Kasparov felt that it

A had been programmed to predict his moves.
B was able to see into his own thought processes.
C used powers that were potentially dangerous to humans.
D was fundamentally different from others he had encountered.

28 What is the writer's main idea in the third paragraph?

A In the last 50 years machines have advanced more quickly than expected.
B There are certain features of chess that machines cannot replicate.
C Skill at chess is more significant than other machine achievements.
D Machines will always be more successful at some tasks than at others.

29 The writer describes the case of an office worker to illustrate the point that

A everyday human actions involve a complex combination of skills.
B some types of mechanical activities require little conscious thought.
C some people are able to carry out multiple tasks at the same time.
D certain human tasks are more intellectually demanding than others.

30 In the fifth paragraph, the writer claims that

A ideas of what success means vary across cultures.
B machines are most effective at game-like activities.
C machines are better at specialisation than at adaptation.
D it may be impossible to isolate different skills involved in an activity.

Questions 31–36

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

*Write the correct letter, **A–J**, in boxes 36–40 on your answer sheets.*

Embodiment: an essential feature

Unlike machines, animals (including humans) have a body, including a brain which has evolved to provide **31** _____ for that body and allow its genes to be passed on. An animal's senses provide it with information about its **32** _____, and then through **33** _____ it can react physically to what it senses. The interaction of the body and brain therefore allows the creation of a link between **34** _____ and action. The **35** _____ which make us human and which distinguish us from animals have their **36** _____ in this link between the brain and the body, and have developed from it.

A	results	**B**	nourishment	**C**	basis
D	qualities	**E**	protection	**F**	evolution
G	surroundings	**H**	values	**I**	perception
J	movement				

Questions 37–40

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

In boxes 37–40 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*

37 Any sort of artificial general intelligence must have the capacity for metabolism and reproduction.

38 Intelligence may depend on the ability to interact with a complex and unpredictable environment.

39 It is dangerous to rely too much on multi-specialist robots which could develop unfixable faults.

40 Training by experts is essential for acquiring certain types of skills.

Questions 27–30 选择题

题号	答案	题干翻译	精确定位（原文，含第 X 段）	定位句翻译	详细解释
27	**D**	与电脑 Deep Blue 下棋时，卡斯帕罗夫觉得它……	**第 2 段**："*…but he allegedly said he sensed an 'alien intelligence' on the other side of the board …*"	"但据说他表示，在棋盘另一侧他感觉到一种'外星般的智能'……"	**D 对**：*alien intelligence* = "不像以往遇到的那种（机械/可预测）的智能"，强调"本质不同"。**A 错**：文中反而说他觉得以前的程序"predictable and mechanical（可预测、机械）"，不是"专门预测他走法"。**B 错**：完全没提"看透他的思维过程"。**C 错**：没说"对人类潜在危险"。
28	**C**	第 3 段作者的主旨是什么？	**第 3 段**："*Of course, a car can move faster… But intellectual prowess is what sets human beings apart… and chess is a supremely intellectual pursuit.*"	"当然，汽车能比最快的短跑运动员更快……但把人类与其他动物区分开的，是智力能力，而国际象棋是一种高度智力性的追求。"	这一段在做"类比对比"：机器超过人类速度/力量不稀奇（车、吊车），但**在'智力'领域超越（下棋）更具象征意义**。所以 **C（下棋成就比其他机器成就更重要/更具意义）**最贴合。**D 错**：段落不是说"机器总有些任务更强"，而是在强调"棋属于智力领域 → 因此意义不同"。**A 错**：没谈"过去 50 年超出预期"。**B 错**：没说"机器无法复制棋的某些特征"。
29	**A**	作者用"办公室职员"的例子是为了说明……	**第 4 段**："*Her day… a busy patchwork of activities… Each of these activities requires the exercise of multiple sensorimotor skills. Consider the task of making a packed lunch…*"	"她的一天……是各种活动拼接而成的忙碌组合……每一项活动都需要多种感觉-运动技能。想想做一份便当这件事……"	作者用"做便当/修复印机/写邮件/开车"等来证明：**日常行为不是单一技能，而是多技能复杂组合（sensorimotor skills 的组合）**，因此 **A 对**。**B 错**：没说"几乎不需要意识思考"。**C 错**：没强调"同时多任务"。**D 错**：不是在比较"哪个更智力"，而是在说"每件小事都牵涉复杂技能链"。
30	**C**	第 5 段作者主张……	**第 5 段**："*In short, a human being is a generalist… a human being is adaptive… It is learned… she can re-train for another one… specialist domains… contrast… failure to produce… general purpose, adaptive intelligence.*"	"总之，人类是通才……人类也具有适应性……这些能力是后天学会的……她还能再培训去做另一份工作……AI 在各类专门领域的成就……与无法产出通用、可适应的智能形成鲜明对比。"	段落核心对比：**AI 强在 specialist（专门任务），弱在 general/adaptive（通用适应）**，所以 **C（机器更擅长专门化而不擅长适应）**。**A 错**：提到不同文化会获得不同技能，但不是说"成功的定义因文化而异"。**B 错**：并未概括成"游戏类最有效"。**D 错**：没说"无法拆分技能"，相反是在说人类能迁移/再训练。

Questions 31–36 Summary 填空（A–J 选词）

> 选项：A results / B nourishment / C basis / D qualities / E protection / F evolution / G surroundings / H values / I perception / J movement

题号	答案	题干翻译（含空格）	精确定位（原文，含第 X 段）	定位句翻译	详细解释
31	**E (protection)**	大脑进化出来是为了给身体提供 **31_____** 并让基因得以传递。	**第 6 段**："*The brain… has evolved to prevent any harm from coming to that body and to perpetuate the genes…*"	"大脑进化出来是为了防止身体受到伤害，并使其携带的基因延续下去……"	"prevent harm"= **protection（保护）**，与句型 *provide protection for…* 精确匹配。
32	**G (surroundings)**	感官提供关于它的 **32_____** 的信息。	**第 6 段**："*…senses, so that its actions can be made to react to the state of the environment …*"	"（身体）有感官，使其行为能对环境状态作出反应……"	"environment / state of the environment" 对应 **surroundings（周围环境）**。
33	**J (movement)**	然后通过 **33_____** 它能对感知作出身体反应。	**第 6 段**："*The body has muscles, enabling it to move …*"	"身体有肌肉，使它能够运动……"	"react physically" 靠 "能动"，原文直给 *move* → **movement**。
34	**I (perception)**	身体与大脑互动形成 **34_____** 与行动之间的连接。	**第 6 段**："*The brain shapes the animal's actions according to what it perceives.*"	"大脑会根据它所感知到的东西来塑造动物的行动。"	"what it perceives"= **perception（感知）**，形成 "感知→行动" 的链路。
35	**D (qualities)**	使我们成为人类、并区别于动物的那些 **35_____** ……	**第 6 段**："*…the human capacities for language, reason, and creativity …*"	"人类的语言、推理与创造力等能力……"	这些 "能力/特质" 概括为 **qualities（特质、特性）**最自然。*values* 是 "价值观"，语义不对。
36	**C (basis)**	……其 **36_____** 在于这种 "脑—身体" 连接，并由此发展。	**第 6 段**："*…all rest on a sensorimotor foundation.*"	"都建立在感觉-运动的基础之上。"	*rest on / foundation* 同义替换为 **basis（基础）**：*have their basis in…* 完美套入句型。

Questions 37–40 YES / NO / NOT GIVEN

题号	答案	题干翻译	精确定位（原文，含第 X 段）	定位句翻译	详细解释
37	**NO**	任何人工通用智能都必须具备新陈代谢与繁殖能力。	**第 7 段**："*…might succeed without much that is essential to biological life, such as metabolism and reproduction …*"	"……也许可以在缺少许多生物生命必需之物（例如新陈代谢与繁殖）的情况下成功……"	原文明确说 **不必需要 metabolism & reproduction**，与题干的 **must have** 正面矛盾 → **NO**。
38	**YES**	智能可能取决于与复杂且不可预测环境互动的能力。	**第 7 段**："*Perhaps the need to engage with a messy, dynamic, physical environment full of complex and varied objects… is at the root of intelligence.*"	"也许与一个混乱、动态、充满复杂多样物体的物理环境互动的需要，正是智能的根源。"	题干是 *may depend on*（可能取决于）= 原文 *perhaps… at the root of*（或许是根源）同方向支持 → **YES**。
39	**NOT GIVEN**	过度依赖多专长机器人很危险，因为它们可能出现无法修复的故障。	**第 8 段**："*…The multi-specialist robot is going to get stuck… outside its areas of expertise …*"	"多专长机器人一旦遇到超出其专长范围的问题，就会卡住……"	只说 **会卡住/无法应对超出专长的问题**；题干新增了 **dangerous、unfixable faults（无法修复故障）**，原文没提 → **NOT GIVEN**。
40	**NO**	专家培训对获得某些技能是必不可少的。	**第 9 段**："*…the ability to adapt… without recourse to trial and error or to training by a third party.*"	"……能够把既有行为适配到新挑战中，并且无需依赖试错或第三方训练。"	作者把 "无需第三方训练" 当作通用智能的标志之一，因此不认同 "训练必不可少" 这一判断 → **NO**。