1. **memory** We need sleep for biological restoration. It promotes cell growth, regeneration and memory consolidation.

2. **concentration** When people are deprived of sleep for any reason, there is deterioration in performance, particularly on tasks requiring concentration, and eventually, behaviour becomes shambolic.

3. **infants** Infants spend up to 50 per cent of their sleep time in REM sleep, which is understandable when one realises that REM sleep is the time used for brain development, as well as learning, thinking, and organising information.

4. **proportion** If people are woken when REM sleep commences, depriving them specifically of dream-sleep, the proportion of REM sleep increases once they fall asleep again to make up what was lost.

5. **epilepsy** Sleep also affects some kinds of epilepsy in complex ways.

6. **immune system** The neurons that control sleep interact strongly with the immune system. As anyone who has had the flu knows, infectious diseases tend to make people feel sleepy.

7. **energy** Sleep helps the body conserve energy that the body's immune system needs to mount an attack.

8. **TRUE** Sleep deprivation is an effective therapy for people with certain types of depression, while it can actually cause depression in other people.

9. **NOT GIVEN** There is nothing in the text relating to this and so the answer is 'not given' in the text

10. **FALSE** Patients who are unable to sleep also notice pain more and may increase their requests for pain medication.

11. **FALSE** Insomnia is a widespread affliction.

12. **TRUE** When insomniacs are observed in a sleep lab, their EEG records often suggest that their sleep pattern is fairly normal, even though in the morning they maintain they hardly slept a wink.

13. **NOT GIVEN** There is nothing in the text relating to this and so the answer is 'not given' in the text.

14. **visible** only comparatively rarely do they reach sufficient brightness to become apparent to the unaided eye.

15. **unpredictable** A planet follows a fairly slow but expected path. By comparison, a comet is a totally different kind of event: it will appear

unexpectedly and at any place in the sky, it will change position from one night to the next relative to the background of stars, and its path will be along a separate direction and path across the sky from the planets and stars.

16. **properties** During the few weeks or months that it is observable, it will first steadily increase in brightness from one night to the next, may change its shape – growing bigger, longer or extra tails – and then wane to invisibility, never to be seen again.

17. **disaster** Throughout history, comets have always signified evil, war and death, and they were supposed to leave chaos and calamity in their wake. Indeed, plenty of past comets have been blamed by the astrologers of their day for bringing or marking misfortune.

18. **observations** During the 17th century, Halley was using Newton's new mathematics of calculus to try to characterise the orbits of twenty-four comets from observations recorded over the previous four centuries.

19. **solid** The nucleus is the sole solid component of a comet

20. **blackened** The ices are blackened, as they contain small fragments of dust embedded within them

21. **low density** the whole nucleus is of a low density, suggesting it to be a partially porous body.

22. **dormant** When travelling along the outer reaches of its orbit, far from the Sun, the nucleus remains frozen and dormant.

23. **sunward** The process is particularly apparent on the sunward flank of the nucleus, where the gases escape as jets

24. **dust** Because the pressure from sunlight is relatively weak, the dust particles end up forming a diffuse curved tail in the direction of the comet's orbit.

25. **gas (ion) / ion** A gas ion tail forms when ultraviolet sunlight rips one or more electrons from gas atoms in the coma, making them into ions. The solar wind then carries these ions straight outward away from the Sun.

26. **dissipate** As a comet heads away from the Sun, its tails dissipate

27. **E** An average of 5000 gallons of chemical additives may be used to frack a well and some of them are toxic.

28. **B** Shale gas is natural methane in rock formations deep underground that, before fracking, was not feasible to extract.

29. **G** Hundreds of best management practices have been identified to employ during energy development and extraction, but most of these are currently voluntary.

30. **D** A lack of sufficient regulatory oversight when the industry began allowed some unfortunate situations and instances of damage that could have been prevented.

31. **A** The discovery of hydraulic fracking in the late 1940's has long allowed companies to extract gas and oil from shale

32. **H** Governments can require disclosure of dangerous materials and establish funding mechanisms to pay for regulatory oversight and for collecting monies to be used to remedy future damages caused by fracking.

33. **F** Recently, it was estimated that in approximately two-thirds of the cases the complete chemical compositions were not reported.

34. **C** Due to shale gas, the US is using less coal and the country's electricity costs have been lowered by about ten per cent.

35. A* After the hydraulic fracturing is completed, some of the fracturing fluid comes back up the well. Because the flowback and wastewater from a well can be toxic, it must be disposed of in a manner that does not create any health, safety, or environmental problems.

36. **C*** The underground areas from which the gas is extracted may be left with cavities, which in turn can sometimes cause ground subsidence.

37. **E*** Sites where wells are drilled for extracting shale gas often cover about two hectares and involve increased traffic

38. **F*** Sites where wells are drilled for extracting shale gas often cover about two hectares and involve increased traffic, noise, light

39. **H*** Without timely information of the chemicals involved in a spill or release, first responders to emergencies, health professionals, and property owners may lack key information for deciding what actions they should take.

40. **D** This is a holistic answer and involves synthesis of the whole text. This text in its entirety fits the answer "To provide an overview of the benefits and risks of US fracking" better than the other three answers.