一、单选题（每题 **1.5** 分，共计 **30** 分）

GRE（**23** 套 **1-20** 题）

二、完形填空（每题 **2** 分，共计 **40** 分）未要求做，可看一下题

Many objects in daily use have clearly been influenced by science,but their form and function,their dimensions and appearance,were determined by technologists,artisans,designers,inventors,and engineers — using nonscientific modes of thought. Many features and qualities of the objects that a technologist thinks about cannot be reduced to unambiguous verbal descriptions;they are dealt with in the mind by a visual,nonverbal process. In the development of Western technology,it has been nonverbal thinking,by and large,that has fixed the outlines and filled in the details of our material surroundings. Pyramids,cathedrals,and rockets exist not because of geometry or thermodynamics,but because they were first a picture in the minds of those who built them.

The creative shaping process of a technologist''s mind can be seen in nearly every artifact that exists. For example,in designing a diesel engine,a technologist might impress individual ways of nonverbal thinking on the machine by continually using an intuitive sense of rightness and fitness. What would be the shape of the combustion chamber? Where should be valves be placed? Should it have a long or short piston? Such questions have a range of answers that are supplied by experience,by physical requirements,by limitations of available space,and not least by a sense of form. Some decisions such as wall thickness and pin diameter,may depend on scientific calculations,but the nonscientific component of design remains primary.

Design courses,then,should be an essential element in engineering curricula. Nonverbal thinking,a central mechanism in engineering design,involves perceptions,the stock-in-trade of the artist,not the scientist. Because perceptive processes are not assumed to entail hard thinking，nonverbal thought is sometimes seen as a primitive stage in the development of cognitive processes and inferior to verbal or mathematical thought. But it is paradoxical that when the staff of the Historic American Engineering Record wished to have drawings made of machines and isometric views of industrial processes for its historical record of American engineering,the only college students with the requisite abilities were not engineering students,but rather students attending architectural schools.

If courses in design,which in a strongly analytical engineering curriculum provide the background required for practical problem-solving,are not provided,we can expect to encounter silly but costly errors occurring in advanced engineering systems. For example,early models of high-speed railroad cars loaded with sophisticated controls were unable to operate in a snowstorm because a fan sucked snow into the electrical system. Absurd random failures that plague automatic control systems are not merely trivial aberrations;they are a reflection of the chaos that results when design is assumed to be primarily a problem in mathematics.Many objects in daily use

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三、改错（每题 1.5 分，共计 15 分）

About half of the infant and maternal deaths in developing countries
could avoided if women had used family planning methods to prevent high risk
_____1_____
pregnancies,according to a report publishing recently by the Johns Hopking
_____2_____
University.The report indicates that 5.6 million infant deaths and 2,000,000 maternal
Deaths could be prevented this year if women chose to have theirs children
_____3_____
within the safest years with adequate intervals among births and limited their
_____4_____
families to moderate size.This amounts to about half of the 9.8 million infant and 370.000
maternal deaths in developing countries,excluded China,estimated for this year by _____5_____
the United Nation’s Children’s Fund and the US Centers for Disease Control respectably.
China was excluded because very few births occur in the high _____6_____
risk categories.The report says that evidences from around the world shows the risk of _____7_____

maternal or infant ill and death is the highest in four specific types of
_____8______
pregnancy; pregnancies before the mother is 18 year old; those after the
_____9_____
mother is 35 years old; pregnancies after four births; and those lesser than
_____10_____
two years apart.

1 had used 改为 used 2 publishing 改为 published 3 theirs 改为 their 4 among 改为 between 5 excluded 改为介词 excluding 6 respectably 改为 respectively 7evidences 改为 evidence 8 ill 改为 illness 9 year 改为 years.10 将 lesser 改为 lessen

四、阅读（每题 3 分，共计 45 分）

TPO 19(1-3，以 tpo 题号记，最后一篇，只有 4 个问)

TPO 19-1 1.A 6.B 8.D 12.C 13.D

TPO 19-2 1.C 4.B 8.D 11.D 13.C

TPO 19-3 3.B 5.B 7.A 9.D

五、summary（20 分）

By the eighteenth century, Britain was experiencing a severe shortage of energy. Because of the growth of population, most of the great forests of medieval Britain had long ago been replaced by fields of grain and hay. Wood was in ever-shorter supply, yet it remained tremendously important. It served as the primary source of heat for all homes and industries and as a basic raw material. Processed wood (charcoal) was the fuel that was mixed with iron ore in the blast furnace to produce pig iron (raw iron). The iron industry’s appetite for wood was enormous, and by 1740 the British iron industry was stagnating. Vast forests enabled Russia to become the world’s leading producer of iron, much of which was exported to Britain. But Russia’s potential for growth was limited too, and in a few decades Russia would reach the barrier of inadequate energy that was already holding England back.

As this early energy crisis grew worse, Britain looked toward its abundant and widely scattered reserves of coal as an alternative to its vanishing wood. Coal was first used in Britain in the late Middle Ages as a source of heat. By 1640 most homes in London were heated with it, and it also provided heat for making beer, glass, soap, and other products. Coal was not used, however, to produce mechanical energy or to power machinery. It was there that coal’s potential was enormous.

As more coal was produced, mines were dug deeper and deeper and were constantly filling with water. Mechanical pumps, usually powered by hundreds of horses waling in circles at the surface, had to be installed. Such power was expensive and bothersome. In an attempt to overcome these disadvantages, Thomas Savery in 1698 and Thomas Newcomen in 1705 invented the first primitive steam engines. Both engines were extremely inefficient. Both burned coal to produce steam, which was then used to operate a pump. However, by the early 1770s, many of the Savery engines and hundreds of the Newcomen engines were operating successfully, though inefficiently, in English and Scottish mines.

In the early 1760s, a gifted young Scot named James Watt was drawn to a critical study of the steam engine. Watt was employed at the time by the University of Glasgow as a skilled crafts worker making scientific instruments. In 1763, Watt was called on to repair a Newcomen engine being used in a physics course. After a series of observations, Watt saw that the Newcomen's waste of energy could be reduced by adding a separate condenser. This splendid invention, patented in 1769, greatly increased the efficiency of the steam engine. The steam engine of Watt and his followers was the technological advance that gave people, at least for a while, unlimited power and allowed the invention and use of all kinds of power equipment.

The steam engine was quickly put to use in several industries in Britain. It drained mines and made possible the production of ever more coal to feed steam engines elsewhere. The steam power plant began to replace waterpower in the cotton-spinning mills as well as other industries during the 1780s, contributing to a phenomenal rise in industrialization. The British iron industry was radically transformed. The use of powerful, steam-driven bellows in blast furnaces helped iron makers switch over rapidly from limited charcoal to unlimited coke (which is made from coal) in the smelting of pig iron (the process of refining impure iron) after 1770. In the 1780s, Henry Cort developed the puddling furnace, which allowed pig iron to be refined in turn with coke. Cort also developed heavy-duty, steam-powered rolling mills, which were capable of producing finished iron in every shape and form.

The economic consequence of these technical innovations in steam power was a great boom in the British iron industry. In 1740 annual British iron production was only 17,000 tons, but by 1844, with the spread of coke smelting and the impact of Cort's inventions, it had increased to 3,000,000 tons. This was a truly amazing expansion. Once scarce and expensive, iron became cheap, basic, and indispensable to the economy.