

生物產業機械第一次期中考

姓名_____學號_____

一、填充題

1. 生物生產系統可概分為_____植物生產_____、_____動物生產_____、_____微生物生產_____等三種。
2. 生物生產環境所需要之要素_____日光氣及營養_____、_____環境溫度及濕度_____、_____設備能源及資訊_____等。
3. 植物生產之作業及其對象如整地作業為_____土壤_____、除草為_____作物_____、噴藥為_____藥劑_____、灌溉為_____水_____、空調為_____空氣_____。
4. 動物生產之作業及其對象如餵飼作業為_____飼料_____、防疫為_____藥劑_____、集蛋為_____家禽_____、擠奶為_____家畜_____、脫繭為_____昆蟲_____。
5. 與植物有關之機械如_____播種機_____、_____移植機_____、_____插秧機_____、_____收穫機_____等。
6. 提高作物產量之新技術有_____肥料之施用_____、_____雜交技術之應用_____等。
7. 生物工程技術的範疇包括_____基因工程技術_____、_____細胞工程技術_____、_____酶工程技術_____、_____生化工程技術_____、_____生物醫藥技術_____等。
8. 風力在農業之利用有_____灌溉_____、_____排水_____、_____穀物脫粒_____、_____粉碎_____、_____機械性動力_____。
9. 風能之優點_____蘊量巨大_____、_____可以再生_____、_____分佈廣泛_____、_____沒有污染_____。
10. 風車發電之組成有_____高塔、艙體_____、_____葉片及轉軸_____、_____變速齒輪箱_____、_____發電機_____、_____控制系統、油壓、冷卻系統_____等。
11. 太陽能抵達地球的部份約_____ %轉化為風能
12. 就技術之發明與發展而言，何者之發明導致後來之發展?(請連線)

搬運車輛(車輪之發明)	蒸汽機
一次工業革命(蒸汽機)	馬孔密克(McComick)
薯穀(風車、電動機)	風車
紡織工業(棉子機)	授田法案
一貫化生產作業線(阿里懷尼(Eli Whitney))	奧圖(OTTO)引擎
收穫機(馬孔密克(McComick))	約翰迪耳(John Deere)
鍊鋼業(柏斯麥轉爐法)	車輪之發明
美國農業實驗站(授田法案)	柏斯麥轉爐法
板犁(約翰迪耳(John Deere))	棉子機
曳引機(奧圖(OTTO)引擎)	電動機
農產加工(電動機)	阿里懷尼(Eli Whitney)
	水車
	迪賽耳Rudolf Diesel)

(以下答案請書寫於答案卷)

13. 請簡單定義名詞：

生物技術(Biotechnology)

The simplest definition of biotechnology is "applied biology." The application of biological knowledge and techniques to develop products.

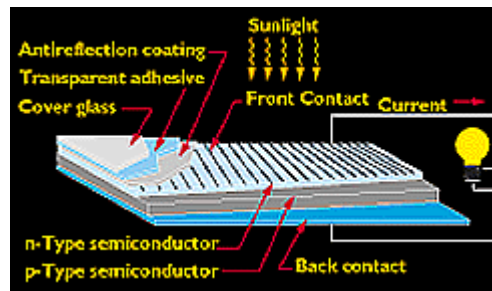
It may be further defined as the use of living organisms to make a product or run a process. By this definition, the classic techniques used for plant and animal breeding, fermentation and enzyme purification would be considered biotechnology.

Some people use the term only to refer to newer tools of genetic science. In this context, biotechnology may be defined as the use of biotechnical methods to modify the genetic materials

of living cells so they will produce new substances or perform new functions.

太陽電池原理(Photovoltaic cells)

光電原理如圖 5.14，當光子打擊到半導體上之原子時，由於加諸能量，使 N 型矽晶(下層)釋放一電子，往上移動，P 型矽晶則產生一電洞往下移動，因而在外邊構成電路。有電壓與電流通過時，即會產生功率。



生物多樣性(Biodiversity)

Most definitions of biodiversity involve a formula that includes not only the number of species in a place, but the abundances (absolute or relative) of those species, as well. The Simpson biodiversity index: $\sum PK^2$

14. 新近風車發電技術改善重點有那些?

- Improvements in the aerodynamics of wind turbine blades, resulting in higher capacity factors and an increase in the watts per square meter of swept area performance factor.
- Development of variable speed generators to improve conversion of wind power to electricity over a range of wind speeds.
- Development of gearless turbines that reduce the on going operating cost of the turbine
- Development of lighter tower structures. A by-product of advances in aerodynamics and in generator design is reduction or better distribution of the stresses and strains in the wind turbine. Lighter tower structures, which are also less expensive because of material cost savings, may be used because of such advances.
- Smart controls and power electronics have enabled remote operation and monitoring of wind turbines. Some systems enable remote corrective action in response to system operational problems. The cost of such components has decreased. Turbine designs where power electronics are needed to maintain power quality also have benefited from a reduction in component costs.

15. 水力發電機組之種類如何?試說明其特性。

伯爾頓(Pelton Turbine)輪機：伯爾頓輪機係利用數道強力水柱直接衝擊轉子上之水杯。故轉子極為類似一付水輪。伯爾頓輪機應用於高水頭地區，範圍由 15M 至 1,800M。其功率可達 200MW。

法蘭西斯(Francis Turbine) 輪機：法蘭西斯水輪之轉子則有固定葉片，數目在九片以上。驅動時水自輻射方向進入，經過葉片後沿中心軸向流出。這種水輪機所應用之水頭在 3M 至 600M 之間，其功率最大為 800MW。

開普蘭輪機(Kaplan turbine)及螺旋片式輪機(Propeller Turbine)：螺旋葉片式輪機之轉子則具有三至六個固定葉片，類似船之推進器。水流經轉子並驅動葉片。螺旋葉式輪機常應用於低水頭之場合，其範圍在 3M 至 90M 之間，功率可達 100MW。開普蘭輪機(Kaplan turbine)則是螺旋葉輪機之改良型，因為其葉片之節矩可以改變，以調節其作業性能。其功率可達 400MW，比螺旋葉式高。