

電郵 _____

座號 _____

手機 _____

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得分 _____

(以下每題 2 分)

1. 宇宙的年齡約 The age of universe is _____ (年 year)
2. 光子能量的表示式是 Expression of photon energy is _____
3. 人體的黑體輻射屬於什麼波段的電磁波?
What range of the blackbody radiation emitted from our body? _____
4. 木星的主要成份是 The planet of Jupiter is mainly accumulated of _____
5. 惰性元素的最外層電子數是
The numbers of electron at the most outer orbit of noble gases are _____
6. 何謂偏振光 What is the polarized light _____
7. 相對論在什麼運動的條件下需要應用
Under what motion condition, we need to use the Relativity _____
8. 理想氣體方程式是 The equation of ideal gas is _____
9. 電源電壓 220V 則峰值是 The voltage amplitude of 220V power supply is _____
10. 質能關係是 The expression of rest energy is _____
11. 轉動的動能是 The expression of rotation energy is _____
12. 列舉 2 種半導體材料 Name 2 materials of semiconductor _____
13. $\Delta x \Delta p \geq h$ 稱為什麼 This relation is named _____
14. 地球自轉軸的進動周期約 The period of earth precession is _____ (年 year)
15. 空氣中的聲速約 The sound speed in the air is about _____ m/s

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16. 水的三相點是 The triple point of water is _____ K

17. 超導體的 2 特性是 The 2 characteristics of superconductor are _____

18. 色散是什麼原因造成? What causes the dispersion? _____

19. 質子在緊密的原子核內如何克服排斥力? Why protons can stay closely inside the nucleus?

20. 列出 5 種可再生能源 List 5 names of renewable energy _____

21. 由於地磁, 赤道上空有高低 2 層(粒子)輻射帶 There are two radiation belts around the earth

due to the earth magnetic field, 上層粒子是 The particle in upper belt is _____

下層粒子是 The particle in lower belt is _____

22. 脫離地球引力的火箭速度是 The escape speed of rocket from the earth is _____ km/s

23. 宇宙的平均溫度是 The average temperature of universe is _____ K

24. 距離太陽最近的恆星約 The nearest star to Sun is about _____ (光年 light year)

25. 產生主要氣象的大氣層高度約 The height of atmosphere for producing major climate is about

_____ km

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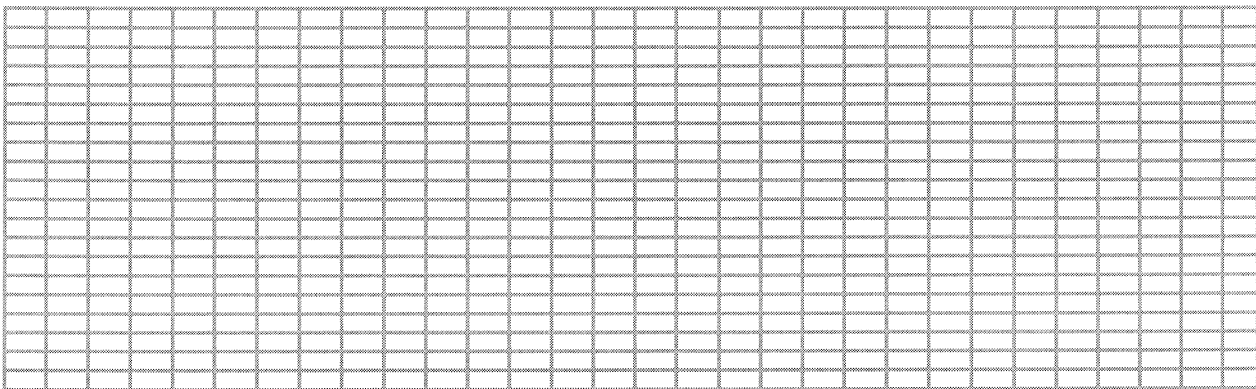
(以下每題 8 分)

1. a. 已知運動周期 T , 振幅 A , 及 $t=0$ 時, $X=X_0$, 以 (\cos, t, T, A, X_0) 表示 $X(t)$
Given period T , amplitude A , and $X=X_0$ at $t=0$, express $X(t)$ in terms of \cos, t, T, A, X_0

- b. 已知向量 $\mathbf{A} = a(\mathbf{i}) + b(\mathbf{j}) + c(\mathbf{k})$, 表示 \mathbf{A} 的大小值
Given vector $\mathbf{A} = a(\mathbf{i}) + b(\mathbf{j}) + c(\mathbf{k})$, express the amplitude of \mathbf{A}

- c. 人車共重 W , 在(水平對地)等速 v 滑動下, 水平射出對地速度 u 的質量 m 後, 求人車速度
Cart weight W with speed v (to the ground) moving horizontal smoothly, find the cart speed after projecting horizontally a mass m with speed u to the ground.

2. 繪函數曲線 $f-v$ 圖 Draw the curve of $f-v$. $f = C v^2 \exp(Bv^2)$, $(C, B) =$ (常數 constant)



(寫單位數值 unit number)

3. 如果用太空太陽能發電站提供電力, 如何輸送電能至地面? (自由發揮) If a solar energy station in space provides electricity to the earth, how to transfer the power to the ground?

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4. a. 你在澳門的體重 W_1 與在赤道上的體重 W_2 不同, W_1/W_2 的表示式是

Your weights in Macao W_1 and in equator W_2 are different, the expression of W_1/W_2 is

b. 你的體積約有幾(m^3) How much (m^3) about of your body volume?

你的體內原子數約有 How many number of atom in your body?

5. 質點 m 牢接在長 L 輕棒的一端, 棒另一端固定在一軸心上 P 點但可上下活動, 若軸心以 ω 速轉動, 在重力場中, 求棒與軸心的夾角. Mass m is located at one end of a light rod pivoted with other end at P point on an axis. If the mass is now rotated with ω speed about the axis under gravitation, what is the angle between the rod and the axis?