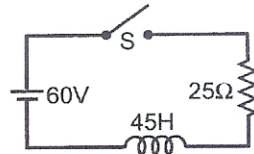


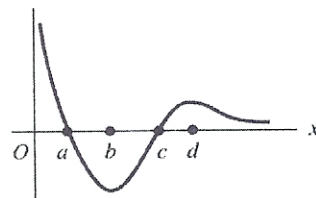
18. A R-L circuit has a 60 V battery, a 45 H inductor, a 25 Ω resistor, and a switch S in series, as shown in right figure. Initially, S is open and there is no magnetic flux in the inductor. At $t = 0$ s, S is closed. When the current is 1.5 A, the rate of change of the current is closest to (A/s) (A) 0.67 (B) 0.58 (C) 0.50 (D) 0.75 (E) 0.83.



19. A 30.0 GHz electromagnetic wave propagates in carbon tetrachloride with a speed of 3.0×10^8 m/s. The wavelength of the wave in carbon tetrachloride is closest to: (A) 10 mm, (B) 10 cm, (C) 10 m, (D) 10 km, (E) 10 nm.
20. The main reason the Michelson-Morley experiment is considered important is that
- (A) it showed that light could exhibit interference effects.
 - (B) it demonstrated that light was an electromagnetic wave.
 - (C) it gave strong experimental support to the special theory of relativity.
 - (D) it demonstrated the existence of the ether.
 - (E) it provided an accurate measurement of the speed of light.

(乙) 複選題 (總共 10 題, 每題 4%, 不倒扣, 答案有一至五個)

21. 有關兩端固定的弦產生的駐波(standing wave), 何者正確? (A)節點(node)與反節點(antinode)的數目一樣, (B)波長 = 弦長除以(節點數目-1), (C)相鄰節點的距離為波長一半, (D)波形不隨時間改變, (E)頻率量子化的原因來自弦端被固定。
22. 在密度均勻的星球表面上, 重力場強度為 g 。如星球的(A)密度加倍, 則 g 變成 $4g$, (B)半徑減半, 則 g 變成 $0.5g$, (C)質量不變, 半徑減半, 則 g 變成 $4g$, (D)密度不變, 體積加倍, 則 g 變成 $2g$, (E)密度加倍, 半徑減半, 則 g 不變。
23. 一個彈珠在 x 軸上的位能函數如右圖所示, 則(A)在 a 點彈珠受力=0, (B)在 c 點彈珠受力=0, (C)穩定平衡點是 b 點, (D)不穩定平衡點是 d 點, (E)在 $x \geq c$ 的區域, 彈珠受到 $+x$ 方向的作用力。



24. 無窮深位能井($0 < x < L : U=0$, 且 $x < 0, x > L : U=\text{inf.}$)中有一質量為 m 的粒子, 下列何者為其可能的波函數

(A) $A \sin \frac{2\pi x}{L}$ (B) $A \sin \frac{\pi x}{2L}$ (C) $A \sin \frac{102\pi x}{L}$ (D) $A \sin \frac{3\pi x}{L}$ (E) $A \sin \frac{5\pi x}{2L}$ 。

25. 已知氫原子的基態(ground state)能階為 -13.6eV , 下列何者為氫原子其他可能的能階

(A) -6.8eV (B) -3.4eV (C) -1.51eV (D) -0.85eV (E) -0.75eV 。