

109 學年度四技二專第二次聯合模擬考試

動力機械群 專業科目(二) 詳解

109-2-02-5

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
D	A	C	B	D	B	D	A	C	A	C	C	A	B	D	C	B	A	D	B
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
B	C	D	B	A	C	C	B	D	B	A	D	A	D	C	A	B	C	D	A

- 1 A 電流 = 6.25×10^{18} 個電子
 6.25×10^{19} 個電子 = 10 A
3. $103 = 10 \times 10^3 \text{ pf} = 10 \times 10^3 \times 10^{-12} \text{ f} = 0.01 \mu\text{f}$
4. $I_1 = \frac{12}{6} = 2 \text{ A}$
 $I_2 = \frac{12}{2} = 6 \text{ A}$
 $I_3 = \frac{12}{3} = 4 \text{ A}$
 $I_1 : I_2 : I_3 = 1 : 3 : 2$
5. $R_1 = \frac{(12)^2}{4} = 36 \Omega$
 $R_2 = \frac{(12)^2}{6} = 24 \Omega$
 $R_T = 36 + 24 = 60 \Omega$
6. 原電路 $R_T = 60 \Omega$
電流 $I = \frac{12}{60} = 0.2 \text{ A}$
短路後， $I = \frac{12}{36} \div 0.33 \text{ A}$
7. 將四個節點連成一點(流入為正)
 $1 - 2 + 3 + 2 - 5 + 2 - A_2 - 3 = 0$ ， $A_2 = -2 \text{ A}$
 $A_1 - 3 + 5 + 2 = 0$ ， $A_1 = -4 \text{ A}$
9. 燈泡 $R = \frac{36}{12} = 3 \Omega$
可承受電流 $I = 2 \text{ A}$
電阻電壓 $\Rightarrow 36 - 6 = 30 \text{ V}$
 $R = \frac{V}{I} = \frac{30}{2} = 15 \Omega$
11. 磁通量若呈線性增加，但 $\frac{\Delta\phi}{\Delta t} = \text{定值}$
感應電勢 $E = N \frac{\Delta\phi}{\Delta t} = \text{定值}$
13. (A) 高斯為磁通密度 CGS 制的單位
14. $e = N \frac{\Delta\phi}{\Delta t} = 100 \times \frac{0.05 - 0.03}{0.05} = 40 \text{ V}$
16. $\omega = 2\pi f$ ， $f = \frac{628}{2 \times 3.14} = 100 \text{ Hz}$
 $T = \frac{1}{f} = \frac{1}{100} = 0.01 \text{ sec}$
17. $V_{p-p} = 200 \text{ V}$

$$V_m = \frac{V_{p-p}}{2} = 100 \text{ V}$$

$$V_{avg} = \frac{2}{\pi} V_m = 63.6 \text{ V}$$

$$18. \bar{Z} = 30 + j40, Z = \sqrt{(30)^2 + (40)^2} = 50 \Omega$$

$$19. 10 \text{ rps} = 600 \text{ rpm}$$

$$f = \frac{p \times n}{120} = \frac{8 \times 600}{120} = 40 \text{ Hz}$$

$$20. S = VI = 800 \text{ VA}$$

$$Q = VI \sin \theta = 480 \text{ VAR}，\text{故 } \sin \theta = 0.6$$

$$\cos \theta = 0.8, P = VI \cos \theta = 800 \times 0.8 = 640 \text{ W}$$

$$0.64 \text{ kW} \times 1 \text{ hr} = 0.64 \text{ 度電}$$

$$23. V_{rms} = 110 \text{ V}, V_{rms} = 0.707 V_p$$

$$V_p = 155.5, V_{pp} = 311 \text{ V}$$

$$24. (A) \text{ Function: 波形選擇}$$

$$(C) \text{ Attenuator: 訊號衰減}$$

$$(D) \text{ Amplitude: 調整電壓振幅之大小}$$

$$26. \text{並聯模式: 電壓不變、電流加倍(相加)}$$

$$29. \text{一般二極體屬被動元件，不具有放大功用，需使用主動元件(如電晶體)才能完成放大電路}$$

$$30. (B) \text{ LED 屬「冷」發光}$$

$$33. T \uparrow \rightarrow \beta \uparrow \rightarrow I_C \uparrow$$

$$34. V_{CC} = 20, V_{BE} = 0.7$$

$$R_C = 1 \text{ k}\Omega$$

$$R_B = 100 \text{ k}\Omega$$

$$\beta = 100$$

$$I_B = \frac{V_{CC} - V_{BE}}{R_B} = \frac{20 - 0.7}{100 \text{ k}\Omega} = 0.193 \text{ mA}$$

$$I_C = \beta I_B = 100 \times 0.193 = 19.3 \text{ mA}$$

$$V_C = V_{CC} - I_C R_C = 20 - 19.3 \text{ mA} \times 1 \text{ k}\Omega = 0.7 \text{ V}$$

$$35. A_1 = I_B = 0.02 \text{ mA}, A_2 = I_C = 2 \text{ mA}$$

$$I_E = I_B + I_C = 2.02 \text{ mA}, \gamma = \frac{I_E}{I_B} = \frac{2.02}{0.02} = 101$$

$$38. A_i(\text{dB}) = 20 \log 100 = 20 \times \log 10^2 = 40 \text{ dB}$$

$$39. A_i = \beta_1 \times \beta_2 = 49 \times 99 = 4851$$

$$40. I_{B1} = \frac{10 - 0.7 - 0.7}{100 + (1 + 49)(1 + 99) \times 1 \text{ k}} \\ = \frac{8.6}{5100 \text{ k}} = 0.00168 \text{ mA} = 1.68 \mu\text{A}$$

