

九十九學年四技二專第五次聯合模擬考試 電機電子群電機類 專業科目 (二) 詳解

99-5-03-5

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

第一部份：電工機械

3. $T \propto V^2$ ，故 $(0.95V)^2 = 0.9025 T$
5. $a = \frac{6600}{220} = 30$
 $S_{自} = (1+a)S_{普} = 31 \times 50 \text{ k} = 1550 \text{ kVA} = 1.55 \text{ MVA}$
7. $\frac{2640}{220} = \frac{2600}{V_2} \Rightarrow V_2 = 216.67$
 則 $V.R = \frac{216.67 - 200}{200} = 8.33\%$
8. V-V 接線供給容量 = $100 \text{ k} \times 2 \times \frac{\sqrt{3}}{2} = 173.21 \text{ kVA}$
9. $Z(\text{leq}) = (40 + 10^2 \times 5.6) + j(150 + 10^2 \times 6.5)$
 $= 600 + j800 = 1000 \angle 53$
 $I_1 = \frac{1000}{1000} = 1 \text{ (A)}$ ，則因 $\frac{N_1}{N_2} = \frac{I_2}{I_1}$ ，故 $I_2 = 10 \text{ (A)}$
13. $E_2' = 5\% \times 100 = 5 \text{ (V)}$
 $N_r = (1-S)N_s = (1-5\%) \times \frac{120}{60} \times 60 = 1140 \text{ (rpm)}$
14. $T = \frac{4 \times 600}{2\pi \times 6} \times 0.03 \times 50 = 95.49 \text{ (NT-m)}$

第二部份：電子學實習

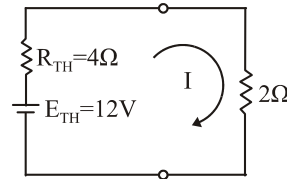
16. 因 D_2 比 D_1 較容易導通，故設 D_1 OFF、 D_2 ON
 $\frac{10 - V_B}{5 \text{ k}} = \frac{V_B - (-10)}{10 \text{ k}} \Rightarrow 20 - 2V_B = V_B + 10$
 $\Rightarrow 10 = 3V_B \Rightarrow V_B = \frac{10}{3}$ ，則假設正確
 $\Rightarrow D_1$ OFF、 D_2 ON
18. $f_o = \frac{1}{2\pi\sqrt{LC}} \Rightarrow \omega_o = \frac{1}{\sqrt{LC}} \Rightarrow 10^4 = \frac{1}{\sqrt{0.1 \times C}}$
 $\Rightarrow 10^8 = \frac{1}{0.1 \times C} \Rightarrow C = 1 \times 10^{-7} = 0.1 \text{ (}\mu\text{F)}$
20. R_1 兩端電壓為 V_i ，因 $R_1 = 2R_2$ ，則 $V_o = 2V_i$
21. $V_{BB} = 6 \text{ (V)}$ ， $I_E = \frac{6 - 0.7}{1 \text{ k}} \cong 5.3 \text{ (mA)}$
 $I_B = \frac{I_E}{1 + \beta} = 0.052 \text{ (mA)} \cong 50 \text{ (}\mu\text{A)}$
25. $r_\pi = (1 + \beta)r_e = 91 \times 5 = 455 \text{ (}\Omega)$

$$A_V = -90 \times \frac{2 \text{ k}}{r_\pi} = -90 \times \frac{2 \text{ k}}{455} \cong -400$$

26. Zener 未崩潰，故 $V_{RL} = 12 \times \frac{200}{100 + 200} = 8 \text{ (V)}$
27. 電容的耐壓選擇可以大代小，故選擇 $500 \mu\text{F}/30 \text{ V}$ 此電容

第三部份：基本電學實習

28. $I_{2\Omega} = 1 + 6 \times \frac{3}{2+3} = 1 + 3.6 = 4.6 \text{ (A)}$
29. $I = \frac{12}{4+2} = 2 \text{ (A)}$



30. $P = \frac{50}{\sqrt{2}} \times \frac{16}{\sqrt{2}} \times \cos 30^\circ = 346.4 \text{ (W)}$
31. $R = \rho \frac{l}{A}$ ， 30°C 下的
 $R_{甲} = \frac{1500}{2^2} = 375$ ， $R_{乙} = \frac{500}{1^2} = 500$
 $R_{乙}$ 大於 $R_{甲}$ ，但 $T \uparrow$ 、 $R \uparrow$
 所以 50°C $R_{乙}$ 又大於 30°C $R_{乙}$
33. $Q = \frac{X_L}{R} = \frac{100}{2} = 50$
37. AF = 框架容量
 AT = 額定電流
 IC = 啓斷容量
 故額定電流 = 20 A