臺北市立大安高級工業職業學校 104 學年度第 1 次教師甄選
汽車科 筆試試題卷

作答說明：1. 請在彌封之答案卷上標明題號依序作答，答案卷上不得書寫姓名或作任何記號。
　　　　　2. 全卷限用藍色或黑色單一顏色筆作答。
　　　　　3. 作答時間 90 分鐘。
　　　　　4. 本試題共四大單元，滿分 100 分。
　　　　　5. 交卷時請將試題卷與答案卷一併繳交。
　　　　　6. 請於所發放的答案卷內完成作答，不加發答案卷。

一、引擎原理及實習 25%
(1~7 為單選題，每題 3 分；第 8 題為計算題，該題 4 分，需列算式，否則不計分)

1. Technician A says that most often the computer is designed to control the ground side of an actuator. Technician B says that most often the engine computer is located in the trunk or luggage compartment of the vehicle. Who is correct?
   (A) A only.　(B) B only.　(C) Both A and B　(D) Neither A nor B

2. Which of the following components in an engine computer translates analog input signals to binary code?
   (A) ROM　(B) CPU　(C) RAM　(D) A/D converter

3. What is a memory DTC?
   (A) A fault code that sets in the PCM's memory during normal driving conditions
   (B) A fault code that must be erased from the PCM's memory after it has been properly repaired
   (C) A fault code that sets as a result of a self test initiated by the technician but does not set in the PCM's memory
   (D) Both A and B

4. During close-loop operation, the engine computer attempts to cause the oxygen sensor to average which of the following?
   (A) 100 millivolts　(B) 450 to 500 millivolts　(C) 900 millivolts　(D) 5 millivolts

5. A vehicle equipped with EFI is brought into the shop with a complaint of poor fuel mileage and is also emitting black smoke out the tailpipe during some driving conditions. A fuel pressure check shows that the fuel pressure is too high. What is the most likely cause?
   (A) A defective fuel pump　(B) A defective fuel pressure regulator　(C) High resistance on the ground side of the fuel pump　(D) A defective PCM

6. Which input values may be monitored by an OBD II PCM to determine if the secondary air injection system is operating properly?
   (A) The oxygen(O_2) sensors　(B) The mass airflow (MAF) sensor　(C) The manifold absolute pressure (MAP) sensor　(D) The crankshaft position (CKP) sensor

7. If a gas analyzer's probe is placed near a fuel line leak, the analyzer readings will show an increase in which of the following?
   (A) H_2O levels　(B) CO_2 levels　(C) HC levels　(D) O_2 levels

8. A six cylinders, 4-stroke cycle gasoline engine with a 8cm bore and 12cm stroke delivers 224 ps(BHP) at 2100 rpm while burning 30kg of fuel per hour. IHP is 275 ps. (4%)
   Find : Torque = ?　(π= 3.0)

二、電工概論與實習 25%
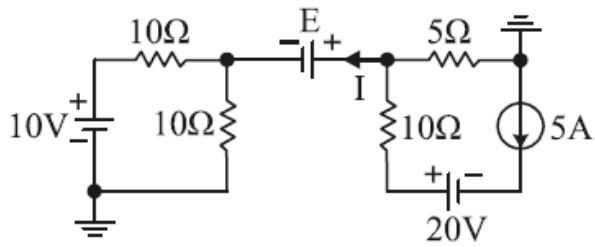
1. 如圖 1 所示，若 I= 0 安培時，電壓源 E 為多少伏特？(8%)

圖 1

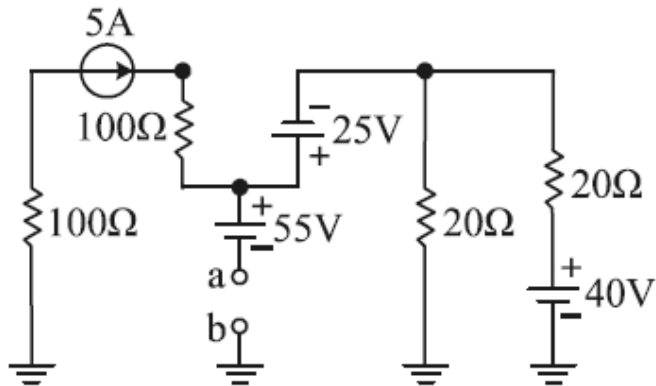2. 如圖 2 所示，若在 a 與 b 兩點間接上一個適當的電阻 R，則該電阻 R 可以獲得最大功率為多少？(8%)

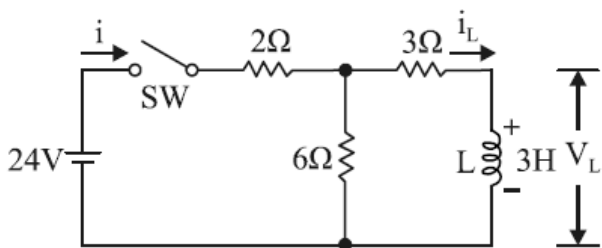
圖 2

3. 如圖 3 所示，假設 t=0 秒時，SW 開關接通後，試求電路穩定後電感器儲存的能量為多少？(9%)

圖 3

三、電子概論與實習 25%

1. 如圖 4 所示，若 FET 之 K = 0.4mA/V^2，臨界電壓 Vth = 2V，V_D = 2V，則 Rs 約為多少? (8%)
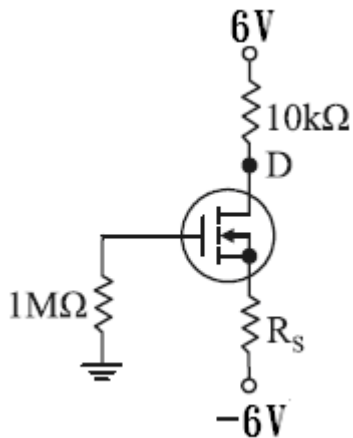
圖 4

2. 如圖 5 所示，電晶體靜態工作點 V_{CE}=6V，集極電流 Ic=1.2mA，β=100，熱電壓 V_T = 26mV，則輸入阻抗 Zi 約為? (8%)
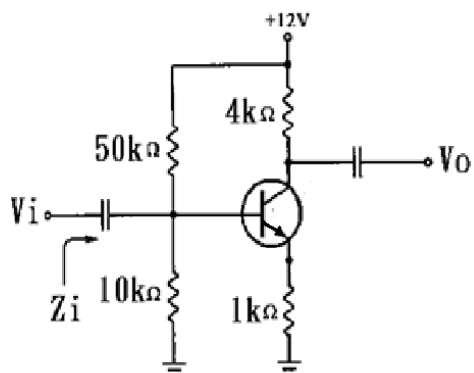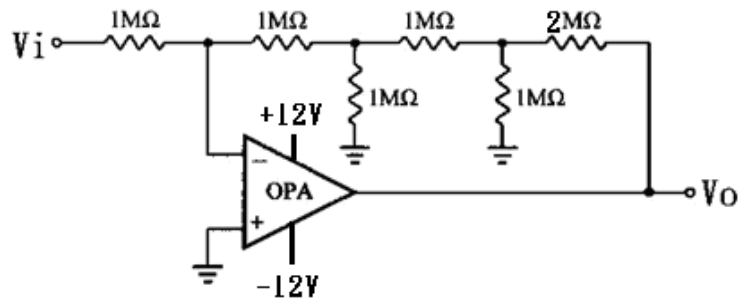

圖 5

3.如圖 6 所示，求 Vo / Vi = ?（9%）

圖 6

四、應用力學 25%

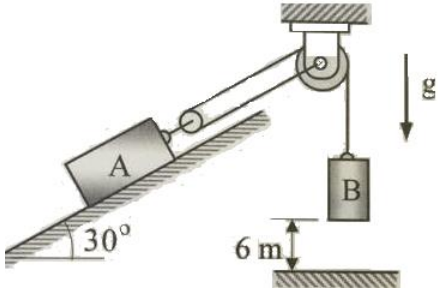1.如圖 7 所示，滑塊 A 重 300kg；滑塊 B 重 150kg，其滑塊 A 與斜面間動摩擦係數為 0.2；B 滑塊距地面 6m，而 B 滑塊由靜止釋放，試問 B 滑塊正要著地瞬間，滑塊 A 的速度 m/sec？（15%）
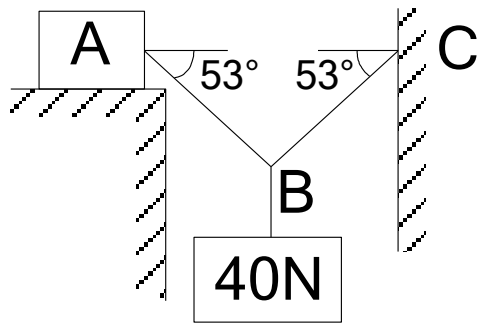

圖 7

2.如圖 8 所示，欲保持平衡，A 的重量應為多少?(設 A 與平面的 μ =0.3)（10%）

圖 8