

※ 本大題請於試卷內之「選擇題作答區」依序作答。

一、單選題 (33%, 每題1.5分)

1. 有關全血計數儀所提供的血小板分佈圖縱向與橫向分別為頻率(frequency)及容積時，下列敘述何者正確？

- a. 分佈為高斯曲線(Gaussian).
- b. 平均容積(mean platelet volume)為14 fL.
- c. 分佈為"log-normal"並有小部份較大型血小板
- d. 平均容積為5 fL

2. 混合試驗(mixing studies)與"Bethesda titers"最主要用於測驗下列何種異常？

- a. vitamin K deficiency.
- b. inhibitors (antibodies) against coagulation factors.
- c. disseminated intravascular coagulation (DIC).
- d. hemophilia.

3. 一位21歲女性病人因月經出血量過多求診，其凝血篩檢結果如下，請問最有可能的病因是下列何者？

Test	Result	Reference range
Prothrombin time (PT)	12.0 seconds	11-15 seconds
Partial thromboplastin time (PTT)	40 seconds	25-37 seconds
Factor VIII activity	35%	50-150%
Platelet count	$225 \times 10^9/L$	$150-400 \times 10^9/L$

- a. hemophilia A
- b. hemophilia B
- c. von Willebrand disease (VWD), type 1
- d. factor X deficiency

4. hemophilia A 與 hemophilia B 或 hemophilia C的最佳鑑別檢驗是下列何者？

- a. specific factor assays
- b. partial thromboplastin time (PTT)
- c. thrombin time
- d. bleeding time

5. 下列檢驗結果最有可能來自哪一種凝血因子缺乏的病人？

Test	Result	Reference range
Prothrombin time (PT)	17 seconds	11-15 seconds
Partial thromboplastin time (PTT)	31 seconds	25-37 seconds
Thrombin time (TT)	16 seconds	15-21 seconds

- a. fibrinogen
- b. VII
- c. VIII
- d. X

見背面

6. 一位病人的aPTT異常，未接受過heparin治療，也無凝血因子缺乏的病史，請問應再加作哪種檢驗？

- a. high sensitivity C-reactive protein (hsCRP)
- b. mixing studies for lupus anticoagulant (LA)
- c. thrombin time
- d. lipid panel

7. 某病人血漿呈現下列結果，請問應再加作哪一項檢驗？

Initial PTT:	95 seconds
Initial PT:	60 seconds
Immediate 1:1 mix with normal plasma (aPTT):	38 seconds
Immediate 1:1 mix with normal plasma (PT):	15 seconds
Incubated 1:1 mix with adsorbed plasma (aPTT):	80 seconds
Incubated 1:1 mix with adsorbed plasma (PT):	16 seconds

- a. dilute Russell's viper venom time (DRVVT)
- b. factor deficient confirmation
- c. factor V Leiden
- d. Bethesda titer

8. 一位37歲女性病人的aPTT是76秒（正常區間為25-37秒），當用正常血漿加作混合試驗（mixing studies）後結果為74秒，請問最適當的診斷是下列何者？

- a. hemophilia A
- b. factor VIII inhibitor
- c. intrinsic factor deficiency
- d. lupus anticoagulant (LA)

9. 有關利用“chromogenic assay”測定antithrombin (AT)的敘述下列何者正確？

- a. The colored end-product intensity is inversely proportional to the AT concentration.
- b. The chromogenic substrate is bound by AT.
- c. Warfarin is added to the patient sample prior to testing to improve sensitivity.
- d. Activated protein C competes for the chromogenic substrate, so it must first be selectively removed.

10. 一位四歲病人因吃入未全熟的碎牛肉而生重病求診，腎臟功能試驗值偏高，輕微血小板缺乏(Thrombocytopenia)，血液抹片出現少數schistocyte，請問最可能的診斷是甚麼？

- a. immune thrombocytopenic purpura (ITP)
- b. thrombotic thrombocytopenic purpura (TTP)
- c. hemolytic uremic syndrome (HUS)
- d. disseminated intravascular coagulation (DIC)

11. 下列哪一種疾病用“plasmapheresis”治療最有效？

- a. immune thrombocytopenic purpura (ITP)
- b. chronic disseminated intravascular coagulation (DIC)
- c. acute disseminated intravascular coagulation (DIC)
- d. thrombotic thrombocytopenic purpura (TTP)

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12. heparin-induced thrombocytopenia (HIT)最嚴重的狀況是下列何者?

- a. hemorrhage
- b. thrombosis
- c. factor XII activation
- d. resistance to aspirin therapy

13. 請問有關 TTP (thrombotic thrombocytopenic purpura)敘述，何者正確?

- a. 病人缺乏降解ULVWF(unusually large von Willebrand factor)的酵素。
- b. 病人血管內皮細胞合成過量ULVWF。
- c. 病人巨核球合成過量ULVWF。
- d. 病人的von Willebrand factor (VWF) 不正常聚集成ULVWF。

14. 血小板與血管因結構異常病變時最常出現下列哪一種症狀?

- a. superficial bleeding
- b. deep tissue bleeding
- c. hemarthrosis
- d. thrombosis

15. 一位病人因常淤血，到院檢驗結果如下:

Platelet count:  $295 \times 10^9/L$

Bleeding time: prolonged

Platelet aggregation: epinephrine: primary but no secondary wave

low-dose ADP: primary but no secondary wave

ristocetin: normal

請問最可能的病因是下列何者?

- a. Bernard-Soulier disease
- b. dense granule deficiency
- c. Glanzmann thrombasthenia
- d. gray platelet syndrome

16. Clopidogrel 是動脈血栓危險群的常用處方藥，主要是源於下列哪種功效?

- a. 抑制thrombin.
- b. 活化protein C.
- c. 抑制platelet.
- d. 活化plasminogen.

17. 某病人經輸注血小板1小時後，測得的CCI (corrected platelet count increment) 為  $3,000/10^{11}/m^2$ 。下列敘述何者正確?

- a. 病人呈現輸注無效.
- b. 病人呈現輸注有效.
- c. 病人無須輸注血小板.
- d. 供血者服用過aspirin.

見背面

18. 一位病人FDP (fibrin degradation products) 呈陽性而D-dimers呈陰性，最有可能的病況是下列何者？

- a. systemic fibrinolysis
- b. disseminated intravascular coagulation
- c. hypofibrinogenemia
- d. deep vein thrombosis

19. 一位53歲女性因喉嚨后出血入院檢查，病人先前無異常出血記錄，只有在16年前因機車意外導致智齒掉落而拔除時曾有凝血異常。此次檢查結果如表列：

	Patient's results	Reference range	1:1 mix with normal plasma
PT	13.1 seconds	11-15 seconds	-
PTT	87 seconds	25-37 seconds	35
Fibrinogen	380 mg/dL	200-400 mg/dL	-

請問病人最有可能的病因是下列何者？

- a. factor XII deficiency
- b. factor IX deficiency
- c. factor VIII deficiency
- d. factor VIII inhibitor

20. 下列何者對antithrombin的結合最低？

- a. Xa.
- b. IXa.
- c. VIIa.
- d. XIa.

21. 下列哪一種抗凝劑治療方式是依賴 ecarin clotting time (ECT) 來監測？

- a. unfractionated heparin
- b. warfarin
- c. low-molecular-weight heparin
- d. direct thrombin inhibitors (DTIs)

22. 有關自動化凝血檢驗儀器的發展與演進，最重要的改善是下列哪一項？

- a. multiple sample dilutions
- b. improved flagging
- c. random access testing
- d. graphing of clot formation

二、何謂 MRD? 有何臨床用途? 試列出 MRD 檢測方法並比較其各別使用限制及優劣點。(20%)

三、請寫出目前臨床血液檢驗單位對血球計數(CBC)所採取的品管措施應包含的內容、執行方式、及各項作業代表的意義。(15%)

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四、解釋名詞(32%，每題4分)

1. transferrin
2. basophilic stippling
3. transcobalamin II
4. orthochromatic normoblast
5. target cell
6. haptoglobin
7. osmotic fragility test
8. polycythemia vera

試題隨卷繳回

