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MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. 2 points for each question.

- 1) When the source host transmits a frame, the frame is addressed to the _____.
A) first switch B) destination application
C) destination host D) first router 1) C

2) When a cloud client customer moves from one machine to another machine, _____.
A) the same application software personalization is in effect
B) the same data files are available
C) both A and B
D) neither A nor B 2) C

3) If a transmission link has a relatively high error rate, _____.
A) fragmentation is likely to increase delivery time for the entire application message
B) fragmentation is likely to reduce delivery time for the entire application message
C) either A or B
D) neither A nor B 3) B

4) When an application program transmits a message, what will the first field be in the message that is sent over the transmission link?
A) application header B) packet header
C) frame header D) transport header 4) A C

5) If a destination host does not receive a segment, it will _____.
A) transmit a NAC segment B) transmit an ACK segment
C) transmit an RSND segment D) none of the above 5) D

6) _____ read(s) the destination address in an Ethernet frame.
A) Switches in the network B) The destination host
C) both A and B D) neither A nor B 6) A C

7) The UDP _____.
A) is unreliable B) has a checksum field
C) both A and B D) neither A nor B 7) C

8) At which layer would you find standards for requesting videos from a video-sharing site such as YouTube?
A) application B) Internet
C) transport D) none of the above 8) A

9) In a firewall, VPN traversal _____.
A) reduces firewall filtering effectiveness
B) increases the effectiveness of firewall filtering
C) both A and B
D) neither A nor B 9) B

10) When a packet that is not part of an ongoing connection and that does not attempt to open a connection arrives at a stateful inspection firewall, the firewall _____. (Read this question carefully.)

10) C

- A) opens a new connection
- C) drops the packet

- B) does not approve the connection
- D) passes the packet

11) Electronic signatures also provide _____ in addition to authentication.

11) A

- A) message integrity
- C) both A and B

- B) message encryption
- D) neither A nor B

12) Which of the following can spread more rapidly?

12) A

- A) directly-propagating worms
- B) directly-propagating viruses
- C) Both of the above can spread with approximately equal speed.

13) When a firewall policy server is used to manage SPI firewalls, what device creates specific ACL rules?

13) C

- A) individual firewalls
- C) the policy server

- B) the SNMP manager
- D) none of the above

14) Oversight activities include _____.

14) B

- A) creating guidelines
- C) both A and B

- B) vulnerability testing
- D) neither A nor B

15) Compared to other methods for reducing problems during momentary traffic peaks, overprovisioning _____.

15) A

- A) increases capital cost
- C) both A and B

- B) increases labor costs
- D) neither A nor B

16) Users of an access point share the transmission capacity of the access point. The throughput a user gets is called the _____.

16) C

- A) aggregate throughput
- C) individual throughput

- B) rated speed
- D) all of the above

17) In digital signaling there is (are) _____ state(s).

17) D

- A) two
- C) an infinite number of

- B) one
- D) a small number of

18) Link aggregation can increase trunk speed by a factor of _____.

18) B

- A) three

- B) two

- C) both A and B

- D) neither A nor B

19) Under the standard, Ethernet switches can provide enough power over UTP for _____.

19) A

- A) wireless access points
- C) both A and B

- B) desktop computers
- D) neither A nor B

20) Ethernet is inexpensive thanks to _____.

20) D

- A) its use of regeneration
- B) its use of multiple switches
- C) its hierarchical topology

- D) its use of the Rapid Spanning Tree Protocol

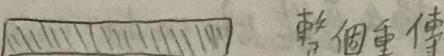
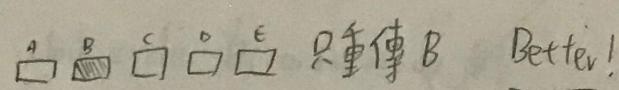
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question. 3 points for each question.

- 21) Why do you think the Internet is a "best effort" delivery system? 21) _____
- 22) Why does Netflix make many transcoded versions of each movie? 22) _____
- 23) What are the advantages of using cloud application programs as a service, compared to traditional application purchasing? 23) _____
- 24) How does fragmentation improve error handling? 24) _____
- 25) How do you think TCP would handle the problem if an acknowledgment were lost, so that the sender retransmitted the unacknowledged TCP segment, therefore causing the receiving transport process to receive the same segment twice? 25) _____
3 2 4
- 26) If you need to represent 18 alternatives in a field, how many bits long must the field be? 26) _____
- 27) What is the role of sequence numbers in segmentation and reassembly? 27) _____
- 28) After a side initiates the close of a connection by sending a FIN segment, will it send any more segments? Explain. 28) _____
- 29) How do viruses and worms differ? 29) _____
- 30) Distinguish between credit card number theft and identity theft. 30) _____
- 31) Follow (30), which tends to produce more damage? Explain. 31) _____
- 32) In digital certificate authentication, what does the supplicant do? 32) _____
10
- 33) In a coffee shop, there are 10 people sharing an access point with a rated speed of 20 Mbps. The throughput is half the rated speed. Several people are downloading. Each is getting five Mbps. How many people are using the Internet at that moment? 33) _____
- 34) A business has an Internet access line with a maximum speed of 100 Mbps. What two things are wrong with this SLA? 34) _____
- 35) Distinguish between defense in depth and weakest link analysis. 35) _____

- 7.2 Y30
- 36) How can jitter be reduced on a user's PC if there is jitter in incoming packets? 36) _____
- 37) Why do core switches need more processing power than workgroup switches? 37) _____
- 38) If the binary transmission rate is 50Mbps, how long will a clock cycle be? Express your answer as a fraction of a second. 38) _____
1s $50,000,000$
- 39) What is the purpose of the Frame Check Sequence Field? 39) _____
 $\frac{1}{50,000,000}$
- 40) How does a host use information in its ARP cache? 40) _____

- | | | | |
|----------------------|----------------------|-------|-----------------------|
| 1. D | 6. A
C | 11. A | 16. C |
| 2. C | 7. C | 12. A | 17. D |
| 3. B | 8. A | 13. C | 18. B
C |
| 4. A
C | 9. B
A | 14. B | 19. A |
| 5. D | 10. C | 15. A | 20. D
C |

-6x2

21. 它所帶來的效應大大改變了人們生活的方式 ✓
22. 若出現錯誤時可以立刻傳送不同的 version ✗ -1
23. 使用上更方便，雲端服務提供基礎設備(IaaS)，軟體(SaaS)和平臺(PaaS)，使用者可以輕鬆在不同地方用不同裝置來使用雲端服務 ✓
24. 把 message 切成比較小段的話，如果 message 某部分有傳錯，則只要重傳那部分，如果不做 fragmentation，則一但有錯就要整個重傳

 Better! ✓
25. TCP 應該會再傳回一次 ACK 給 sender ✓
26. 3 個 bits ✓
27. 如果經過拆段之後的 message 順序亂掉了，就可以透過 sequence number 來找回順序重組回原本的 message ✓

28. 會，它送了 FIN segment 之後，server 端會回傳 ACK 代表它收到該 side 的 close connection 請求，之後 server 端會傳送 FIN 到該 side，此時 它再回傳 ACK 後，connection 就會停止

29. Worms 會透過一臺受感染的裝置跳到別臺未受感染的裝置並去 感染它。它可以獨立運作

Viruses 則是附加在某些 program 上的一段 code。它無法獨立運作， 需要透過人為方式來傳播

30. credit card number theft 只盜用某人的 credit card，造成財富上的 損失。

Identity theft 則盜用它人身分去從事不好的活動，且它所造成 的通常還有個人信用上的損失，此損失可能比 credit card number theft 來得大很多

31. identity theft，因為除了財富上的損失，可能還有信用，名譽上的損失

32. supplicant 將 verifier 傳來的 challenge message 用自己的私鑰加密

33. 2 people

34. ① Speed 應該要是 minimum speed

② 它沒有提到最大的 latency 是多少

35. defense in depth : 使用很多層的防護，只要守住其中任一個點就成功
weakest link analysis: 找出最 weak 的點去投入資源做防護，只要這個點被攻
破就失敗了

36. 在送出 packet 時調整送出的頻率來減少 jitter

37. core switch 連接其它的 switch，且其中也會包括 workgroup switch，所以它
接觸到的 device 比 workgroup switch 多很多，所以需要更多 processing power

38. binary transmission 的話每個訊號只有 1 個 bit，因此 2 個訊號間的空隔
為 $\frac{1}{50,000,000} = 0.000\ 00002$ 秒

⇒ clock cycle 為 $0.000\ 00002$ 秒

39. 檢查 frame 中有沒有那個部份 lost 掉或順序亂掉

40. 使用 ARP cache 來節省檢查的時間，若外部 host 的 IP to host 的 address
符合，則直接放行通過
ARP cache 上的資料