(#1-10) Choose the one word or phrase that best completes each sentence. (1.5 points for each question)

1. A fast moving wildfire _____ an estimated 25,000 acres in less than seven hours in Southern California.
① engulfed ② drowned
③ invigorated ④ pacified

2. Often our emotions _____ us, and we speak or act without thinking first.
① put up with ② come up with
③ make up for ④ get the better of

3. Big changes can start with very small steps. Small changes tend to _____.
① backtrack ② expire
③ shrink ④ snowball

4. There are a variety of superfoods that will _____ the immune system.
① ramp up ② give up
③ pick up ④ catch up

5. By _____ where you trip up or make mistakes, you're being honest with yourself.
① getting away with ② owning up to
③ looking down on ④ turning away from

6. In the _____ of this incident, many kind people reached out to my mother to express their outrage on her behalf.
① mock ② spite
③ wake ④ pity

7. Barring disease, we walk erect and correctly throughout our lives until our structure _____ with old age and we need to be propped up with canes or the like.
① deteriorates ② fortifies
③ rehabilitates ④ ripens

8. For any animal, happiness seems to _____ in the opportunity to express its creaturely character—its essential pigness or wolfness.
① compose ② dwindle
③ belie ④ consist

9. We know through painful experience that freedom is never _____ given by the oppressor; it must be demanded by the oppressed.
① reluctantly ② voluntarily
③ indignantly ④ belatedly

10. In a given area the plague accomplished its kill within four to six months and then faded, except in the larger cities, where, rooting into the close-quartered population, it _____ during the winter, only to reappear in spring and rage for another six months.
① flourished ② soared
③ abated ④ consummated

(#11-15) Choose the one word or phrase that is closest in meaning to the underlined part. (2 points for each question)

11. Sam made a pathetic attempt to explain his failure; his coworkers didn't quite buy his excuse.
① feeble ② valiant
③ effective ④ formal

12. Everything repulsive about him merely reinforced his authenticity.
① prolonged ② twisted
③ reduced ④ strengthened

13. The industrial processes and scientific knowledge that created technowar had also brought forth a new means of perceiving its devastation.
① invention ② hypocrisy
③ destruction ④ cruelty

14. Writers don't seem to benefit much by the advance of science, although they thrive on superstitions of all kinds.
① ignore ② draw on
③ respect ④ throw out

15. Ultimately it will be the student's own business to break the circles in which they are trapped.
① Basically ② In the beginning
③ Frankly ④ Under certain circumstances

(#16-20) Identify the one underlined expression that must be corrected in each sentence. (2 points for each question)

16. In my third-grade ① class, our math tests were being ② passed down the rows, and as I handed the papers to a little boy in back of me, I remarked that once again he had received a much ③ lower mark as ④ I did.

17. To sign up, visit the website http://www.xyz.com, which ① has ② instructions to ③ how to register ④ for the service.

18. Siena's master painters, the brothers ① Ambrogio and Pietro Lorenzetti, whose ② names never appear after 1348, presumably perished in ③ the plague, as was ④ Andrea Pisano.

19. He is expected ① to visit Britain in ② February although ③ a public spat with Theresa May over ④ his Twitter account.

20. Some repairs are too ① extensive for a DIY attempt, such as ② replacing a ③ floor surface or install ④ a large patch of drywall.

(#21-25) Read the following passages and choose the one best answer for each question. (3 points for each question)

Questions 21-23 are based on the following passage.

Nobody reveals an accurate picture of their actual lives on social media. They omit the bickering, boring and unflattering aspects of their lives in favor of the fabulous moments. The downside of this "success theater" is that daily exposure to Facebook leaves people feeling (**A**). That constant barrage of other people's best moments creates the illusion that everyone else in the world is living these wonderful lives filled with success and joy and adventure while you're sitting there, well, looking at Facebook. **This** occurs on other sites like Instagram.

21. The author seems to believe that _____
① looking at other people's Facebook encourages better self-care.
② uploading pictures to Facebook has to do with high self-esteem.
③ frequent exposure to other folks' Facebook could increase risks for depression.
④ users of Facebook tend to be more outgoing than those who do not use it.

22. What does the underlined "This" mean?
① The opposite illusion
② The boring aspect of others' lives
③ The more accurate picture
④ The same phenomenon

23. Which of the following is most appropriate for blank (A)?
① inadequate ② important
③ secure ④ relieved

Questions 24-25 are based on the following passage.

In our society death is viewed as (**A**), discussion of it is regarded as morbid, and children are excluded with the presumption and pretext that it would be "too much" for them. They are then sent off to relatives, often accompanied with some unconvincing lies of "Mother has gone on a long trip" or other unbelievable stories. The child senses that something is wrong, and his distrust in adults will only multiply if other relatives add new variations of the story, avoid his questions or suspicions, shower him with gifts as a meager substitute for a loss he is not permitted to deal with. Sooner or later the child will become aware of the changed family situation and, depending on the age and personality of the child, will have an unresolved grief and regard this incident as a frightening, mysterious, in any case very traumatic experience with untrustworthy grownups, which he has no way to cope with.

24. Which of the following is most appropriate for blank (A)?
① spectacle ② mystery
③ taboo ④ ritual

25. It can be inferred from the passage that the author takes a(n) _____ attitude toward the way death is dealt with in our society.
① neutral ② ironic
③ approving ④ critical

26. $f(x)=\cot^{-1}x$이고 $g(x)=e^{\frac{2}{3}}-(1+2x^2)^{\frac{1}{3x^2}}$ 일 때, 극한 $\lim_{x\to 0} f[g(x)]$을 구하면? [2점]

① $\frac{\pi}{4}$ ② $-\frac{\pi}{4}$ ③ $\frac{\pi}{2}$ ④ $-\frac{\pi}{2}$

27. $f(x,y)=1-e^{-x}-xe^{-x}+y$의 점 $P(a,2)$에서 u$=2$i$+3$j 방향으로의 방향도함수가 최대가 되는 a의 값은? [2점]

① 1 ② 2 ③ 3 ④ 4

28. 다음 중 옳은 것을 모두 고르면? [2점]

ㄱ. $\sin^{-1}\left(\sin\frac{5\pi}{6}\right)=\frac{\pi}{6}$

ㄴ. $\lim_{x\to\infty}\left(\cos\frac{1}{x}\right)^x=e$

ㄷ. $\lim_{x\to 1}\frac{1}{x-1}\int_{-x}^{x}\tan^{-1}u\,du=0$

ㄹ. $\sum_{n=1}^{\infty}\frac{\ln n}{n}x^n$의 수렴반경과 수렴구간은 각각 1과 $[-1,1)$이다.

① ㄱ, ㄴ, ㄷ ② ㄱ, ㄴ, ㄹ ③ ㄴ, ㄷ, ㄹ ④ ㄱ, ㄷ, ㄹ

29. $\int_0^1\int_y^1 e^{x^2}dxdy$를 구하면? [2점]

① $\frac{e-1}{2}$ ② $\frac{e+1}{2}$ ③ $\frac{e^2-1}{2}$ ④ $\frac{e^2+1}{2}$

30. 다음 중 옳은 것을 모두 고르면? [2점]

ㄱ. A의 모든 고유벡터는 A^2의 고유벡터이다.
ㄴ. 가역인 행렬 A의 고윳값은 A^{-1}의 고윳값이다.
ㄷ. A의 모든 고윳값은 A^2의 고윳값이다.
ㄹ. 고윳값은 반드시 0이 아닌 상수이다.

① ㄱ ② ㄱ, ㄴ ③ ㄱ, ㄷ ④ ㄱ, ㄹ

31. 평면 $z=0$과 이루는 사잇각이 $\frac{\pi}{3}$이고 점 $P(2,1,1)$을 지나는 평면은? [2점]

① $x+\sqrt{2}y+\sqrt{2}z=2+2\sqrt{2}$ ② $\sqrt{2}x+y+\sqrt{2}z=1+3\sqrt{2}$
③ $x+\sqrt{2}y+z=3+\sqrt{2}$ ④ $\sqrt{2}x+\sqrt{2}y+z=1+3\sqrt{2}$

32. 직선 $\frac{x-3}{2}=y-5=\frac{z+4}{3}$과 평면 $-2x+y+z=3$ 사이의 최단 거리는? [2점]

① 0 ② $\frac{4\sqrt{6}}{3}$ ③ $\frac{2\sqrt{6}}{3}$ ④ $\frac{\sqrt{6}}{3}$

33. 다음 중 옳은 것을 모두 고르면? [2점] (단, O 은 영행렬이다)

ㄱ. $A^TA=O$ 이면 $A=O$ 이다.
ㄴ. $A+A^2=I$ 이면 A는 가역이다.
ㄷ. n차 정사각행렬 A와 B가 가역이면 $A+B$도 가역이다.
ㄹ. 모든 열벡터들이 1차 독립인 n차 정사각행렬 A와 B에 대하여 곱 AB의 모든 행벡터들도 1차 독립이다.

① ㄱ, ㄴ, ㄷ ② ㄱ, ㄴ, ㄹ ③ ㄱ, ㄷ, ㄹ ④ ㄴ, ㄷ, ㄹ

34. 행렬 $A=\begin{pmatrix} a & b \\ c & d \end{pmatrix}$에 대하여 다음 중 거짓인 것을 모두 고르면? [2점]

ㄱ. A의 고윳값은 모두 실수이다.
ㄴ. 1이 A의 유일한 고윳값이면 A는 단위행렬이다.
ㄷ. A의 모든 고윳값이 0이면 A는 영행렬이다.
ㄹ. u, v가 A의 고유벡터이면 $u+v$도 A의 고유벡터이다.

① ㄱ, ㄴ, ㄷ ② ㄱ, ㄴ, ㄹ ③ ㄴ, ㄷ, ㄹ ④ ㄱ, ㄴ, ㄷ, ㄹ

35. $A^T = A^T A$ 일 때 다음 중 옳은 것을 모두 고르면? [2점]

ㄱ. $A = A^T$
ㄴ. $\det(A) = 1$
ㄷ. $A^2 = A$
ㄹ. $A^{-1} = A^T$

① ㄱ, ㄴ ② ㄱ, ㄷ ③ ㄱ, ㄴ, ㄷ ④ ㄱ, ㄴ, ㄹ

36. 극한 $\lim_{x\to 0}\left[1+x-\tan^{-1}x\right]^{\frac{1}{x^3}}$을 구하면? [3점]

① e ② e^{-1} ③ $e^{-\frac{1}{3}}$ ④ $e^{\frac{1}{3}}$

37. $f(x)=e^{\sin x}$의 역함수를 $g(x)$라 하면, $\lim_{h\to 0}\frac{g(1+3h)-g(1-h)}{h}$의 값은? [3점]

① 1 ② 2 ③ 3 ④ 4

38. 곡선 $f(x)=\cos x\ (0\leqq x\leqq \pi)$를 x축으로 회전한 곡면의 표면적은? [3점]

(단, 계산과정에서 다음 적분공식을 사용할 수 있음.)

$$\int \sec^3 x\,dx=\frac{1}{2}(\sec x\tan x+\ln|\sec x+\tan x|)+c$$

① $2\pi[2\sqrt{2}+\ln(1+\sqrt{2})]$ ② $2\pi[\sqrt{2}+\ln(1+\sqrt{2})]$

③ $2\pi[\sqrt{2}+2\ln(1+\sqrt{2})]$ ④ $4\pi[\sqrt{2}+\ln(1+\sqrt{2})]$

39. 원 $r=2a\sin\theta$의 내부와 $r=a\ (a>0)$의 외부로 둘러싸인 부분의 넓이는? [3점]

① $\left(\frac{\pi}{3}+\frac{\sqrt{3}}{2}\right)a^2$ ② $\left(\frac{2\pi}{3}+\frac{\sqrt{3}}{2}\right)a^2$ ③ $\left(\frac{\pi}{3}+\frac{\sqrt{3}}{3}\right)a^2$ ④ $\left(\frac{2\pi}{3}+\frac{\sqrt{3}}{3}\right)a^2$

40. $\int_1^x (x-t)f(t)dt=ax^3+\frac{1}{2}x^2-2x+\frac{7}{6}$을 만족하는 함수 $f(x)$와 a는? [3점]

① $a=1,\ f(x)=x+1$ ② $a=1,\ f(x)=2x+1$ ③ $a=\frac{1}{3},\ f(x)=x+1$ ④ $a=\frac{1}{3},\ f(x)=2x+1$

41. 함수 $A(n)=\int_0^\infty t^{n-1}e^{-t}dt$ (n은 양의 정수)대하여 $\frac{A(n)}{A(n-1)}+\frac{A(n-1)}{A(n-2)}+\frac{A(n-2)}{A(n-3)}+\cdots+\frac{A(2)}{A(1)}$을 구하면? [3점]

① $\frac{(n-1)(n-2)}{2}$ ② $\frac{n(n-1)}{2}$ ③ $\frac{n(n+1)}{2}$ ④ $\frac{(n+1)(n+2)}{2}$

42. 곡면 $z=7-3x^2-y^2$과 평면 $z=x+y+1$의 교선상의 점$(1,1,3)$에서 교선에 대한 접선방정식을 구하면? [3점]

① $\frac{x-1}{6}=\frac{y-1}{2}=z-3$ ② $x-1=y-1=3-z$

③ $\frac{x-1}{3}=\frac{1-y}{7}=\frac{3-z}{4}$ ④ $\frac{1-x}{3}=\frac{1-y}{7}=\frac{3-z}{4}$

43. 행렬 $A=\begin{pmatrix}1&2&-1&-1\\-1&0&0&1\\-2&0&0&2\\1&2&-1&-1\end{pmatrix}$에 대하여 $(I-A)^{-1}$의 모든 원소의 합은? [3점] (단, I는 4×4 단위행렬)

① 6 ② -6 ③ 3 ④ -3

44. $A=\begin{pmatrix}0.9&0.1\\0.4&0.6\end{pmatrix}$이면 $\lim_{n\to\infty}A^n$을 구하면? [3점]

① $\begin{pmatrix}0&0\\0&0\end{pmatrix}$ ② $\frac{1}{5}\begin{pmatrix}1&0\\0&1\end{pmatrix}$ ③ $\frac{1}{5}\begin{pmatrix}4&1\\4&1\end{pmatrix}$ ④ $\frac{1}{5}\begin{pmatrix}1&4\\1&4\end{pmatrix}$

45. 선형사상 $L:\mathbb{R}^3\to\mathbb{R}^3$가 $L(x,y,z)=(x-y+2z,y,x+2z)$를 만족할 때, 벡터 $(1,0,0)$의 $\ker(L)$ 위로의 직교정사영은? [3점]

① $\frac{2}{5}(-2,1,1)$ ② $\frac{2}{5}(2,1,-1)$ ③ $\frac{2}{5}(2,0,-1)$ ④ $\frac{2}{5}(2,0,1)$

정답	
문항	정답
01	1
02	4
03	4
04	1
05	2
06	3
07	1
08	4
09	2
10	3
11	1
12	4
13	3
14	2
15	1
16	4
17	3
18	4
19	3
20	4
21	3
22	4
23	1
24	3
25	4
26	3
27	1
28	4
29	1
30	1
31	3
32	2
33	2
34	4
35	2
36	4
37	4
38	2
39	1
40	4
41	2
42	3
43	1
44	3
45	3