(iii) 当 $x \in (\frac{\pi}{2},\pi]$ 时,f'(x) < 0,所以f(x) 在 $(\frac{\pi}{2},\pi)$ 单调递减. 而 $f(\frac{\pi}{2}) > 0$,

 $f(\pi)<0$, 所以 f(x) 在($\frac{\pi}{2}$, π)有唯一零点.

(iv) 当 $x \in (\pi, +\infty)$ 时, $\ln(x+1) > 1$,所以f(x) < 0,从而f(x)在 $(\pi, +\infty)$ 没有零点. 综上, f(x)有且仅有2个零点.

21. 解:

(1) X的所有可能取值为-1,0,1.

 $P(X=-1)=(1-\alpha)\beta.$

 $P(X=0)=\alpha\beta+(1-\alpha)(1-\beta)\;,$

 $P(X=1)=\alpha(1-\beta).$

所以 X 的分布列为

$$\begin{array}{c|cccc} X & -1 & 0 & 1 \\ \hline P & (1-\alpha)\beta & \alpha\beta + (1-\alpha)(1-\beta) & \alpha(1-\beta) \end{array}$$

(2)(i)由(1)得a=0.4, b=0.5, c=0.1. 因此 $p_i = 0.4 p_{i-1} + 0.5 p_i + 0.1 p_{i+1}$,故 $0.1 (p_{i+1} - p_i) = 0.4 (p_i - p_{i-1})$,即

 $p_{i+1} - p_i = 4(p_i - p_{i-1})$.

又因为 $p_1 - p_0 = p_1 \neq 0$,所以 $\{p_{i+1} - p_i\}(i = 0, 1, 2, \cdots, 7)$ 为公比为4,首項为 p_i 的等比 数列.

(ii)由(i)可得

$$\begin{aligned} p_{k} &= p_{k} - p_{r} + p_{r} - p_{s} + \dots + p_{l} - p_{0} + p_{0} \\ &= (p_{k} - p_{r}) + (p_{r} - p_{k}) + \dots + (p_{l} - p_{0}) \\ &= \frac{4^{d} - 1}{3} p_{l}. \end{aligned}$$

由于 $p_k=1$,故 $p_i=\frac{3}{4^k-1}$,所以

$$p_{4} = (p_{4} - p_{3}) + (p_{1} - p_{2}) + (p_{2} - p_{1}) + (p_{1} - p_{0})$$

$$= \frac{4^{4} - 1}{3} p_{1}$$

$$= \frac{1}{3} p_{1}$$

p. 表示最终认为甲药更有效的概率。由计算结果可以看出,在甲药治愈率为0.5,

乙药治愈率为 0.8 时,认为甲药更有效的概率为 $p_4 = \frac{1}{257} \approx 0.0039$,此时得出错误结论 的概率非常小,说明这种试验方案合理.

(1) 因为
$$-1 < \frac{1-t^2}{1+t^2} \le 1$$
,且 $x^2 + (\frac{y}{2})^2 = (\frac{1-t^2}{1+t^2})^2 + \frac{4t^2}{(1+t^2)^2} = 1$,所以 C 的直角坐标

方程为 $x^2 + \frac{y^2}{1} = 1 (x \neq -1)$.

1的直角坐标方程为 $2x+\sqrt{3}y+11=0$.

(2) 由 (1) 可设C的参数方程为 $\begin{cases} x = \cos \alpha, (\alpha 为参数, -\pi < \alpha < \pi). \end{cases}$

C上的点到1的距离为

$$\frac{|2\cos\alpha+2\sqrt{3}\sin\alpha+11|}{\sqrt{7}}=\frac{4\cos(\alpha-\frac{\pi}{3})+11}{\sqrt{7}}.$$

(1) 因为 $a^2 + b^2 \ge 2ab$, $b^2 + c^2 \ge 2bc$, $c^2 + a^2 \ge 2ac$, 又abc = 1, 故有 $a^{2} + b^{2} + c^{2} \ge ab + bc + ca = \frac{ab + bc + ca}{abc} = \frac{1}{a} + \frac{1}{b} + \frac{1}{c}$

所以 $\frac{1}{a} + \frac{1}{b} + \frac{1}{a} \le a^2 + b^2 + c^2$.

(2) 因为a, b, c为正数且abc=1, 故有

 $(a+b)^3 + (b+c)^3 + (c+a)^3 \ge 3\sqrt[3]{(a+b)^3(b+c)^3(a+c)^3}$

=3(a+b)(b+c)(a+c)

 $\geq 3 \times (2\sqrt{ab}) \times (2\sqrt{bc}) \times (2\sqrt{ac})$

所以 $(a+b)^3+(b+c)^3+(c+a)^3 \ge 24$.

听第9段材料,回答第14至17题。

A. He lacks motivation.

A. To encourage the man.

C. To support her findings.

A. 300 minutes.

B. To recommend an exercise.

听第 10 段材料, 回答第 18 至 20 题。

A. They repaired it.

A. It's warm.

18. What did the scientists do to the road?

19. Why are young birds drawn to the road surface?

20. What is the purpose of the scientists' experiment?

A. To keep the birds there for a whole year.

B. To help students study the birds well.

C. To prevent the birds from being killed.

A. He's an athlete.

14. Why does the man seldom do exercise?

15. What does Jacob Sattelmair probably do?

16. Why does the woman speak of a study?

17. How much time will the man probably spend exercising weekly?

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B. He's a researcher.

B. 150 minutes.

B. They painted it.

B. It's brown.

B. He has a heart problem.
C. He works all the time.

C. He's a journalist.

C. 75 minutes.

C. They blocked it

C. It's smooth.

绝密★启用前

2019年普通高等学校招生全国统一考试

英 语

注意事项:

- 1. 答卷前,考生务必将自己的姓名、考生号等填写在答题卡和试卷指定位置上。
- 2. 回答选择题时,选出每小题答案后,用铅笔把答题卡上对应题目的答案标号涂 黑。如需改动,用橡皮擦干净后,再选涂其他答案标号。回答非选择题时,将答案写在 答题卡上,写在本试卷上无效。
- 3. 考试结束后,将本试卷和答题卡一并交回。

第一部分 听力 (共两节, 满分30分)

做题时,先将答案标在试卷上。录音内容结束后,你将有两分钟的时间将试卷上的 答案转涂到答题卡上。

第一节 (共5小题: 每小题1.5分, 满分7.5分)

听下面 5 段对话。每段对话后有一个小题,从题中所给的 A、B、C 三个选项中选 出最佳选项。听完每段对话后,你都有10秒钟的时间来回答有关小题和阅读下一小题。 每段对话仅读一遍。

例: How much is the shirt?

A. £19.15. B. £9.18. 答案是 C.

C. £9.15.

1. Where does this conversation take place?

A. In a classroom. B. In a hospital. 2. What does Jack want to do?

A. Take fitness classes. B. Buy a pair of gym shoes.

C. Change his work schedule

3. What are the speakers talking about?

A. What to drink.

B. Where to meet.

4. What is the relationship between the speakers?

B. Classmates.

C. Strangers.

C. When to leave

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5. Why is Emily mentioned in the conversation?

A. She might want a ticket.

B. She is looking for the man.

C. She has an extra ticket.

第二节 (共15小题: 每小题 1.5分, 满分 22.5分)

听下面 5 段对话或独白。每段对话或独白后有几个小题,从题中所给的 A、B、C 三个选项中选出最佳选项。听每段对话或独白前,你将有时间阅读各个小题,每小题 5 秒钟: 听完后,各小题将给出5秒钟的作答时间。每段对话或独白读两遍。

听第6段材料,回答第6、7题。

6. How long did James run his business?

A. 10 years.

B. 13 years.

7. How does the woman feel about James' situation?

B. Concerned. A. Embarrassed.

听第7段材料, 回答第8至10题。

8. What has Kate's mother decided to do?

A. Return to school. B. Change her job.

9. What did Kate's mother study at college? B. Art history.

A. Oil painting.

C. Retire from work.

10. What is Kate's attitude toward her mother's decision?

A. Disapproving.

C. Business administration.

听第8段材料,回答第11至13题。

11. What is the man doing?

A. Chairing a meeting. B. Hosting a radio program.

C. Conducting a job interview 12. What benefits Mary most in her job?

B. Her leaders' guidance. C. Her friends' help. A. Her wide reading.

13. Who will Mary talk about next?

A. Her teacher.

B. Her father.

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C. Understanding.

C. Her mother.

C. 15 years.

C. Disappointed.

第二部分 阅读理解(共两节, 满分40分)

第一节 (共15小题: 每小题2分, 满分30分)

阅读下列短文,从每题所给的A、B、C和D四个选项中,选出最佳选项。

Need a Job This Summer?

The provincial government and its partners offer many programs to help students find summer jobs. The deadlines and what you need to apply depend on the program.

Not a student? Go to the government website to learn about programs and online tools available to help people under 30 build skills, find a job or start businesses all year round.

Jobs for Youth If you are a teenager living in certain parts of the province, you could be eligible (符合条

Summer Company

A. Colleagues.

件) for this program, which provides eight weeks of paid employment along with training. Who is eligible: Youth 15-18 years old in select communities (社区).

Summer Company provides students with hands-on business training and awards of up

to \$3,000 to start and run their own summer businesses. Who is eligible: Students aged 15-29, returning to school in the fall.

Stewardship Youth Ranger Program You could apply to be a Stewardship Youth Ranger and work on local natural resource management projects for eight weeks this summer.

Who is eligible: Students aged 16 or 17 at time of hire, but not turning 18 before December 31 this year.

Summer Employment Opportunities (机会)

Through the Summer Employment Opportunities program, students are hired each year in a variety of summer positions across the Provincial Public Service, its related agencies and

Who is eligible: Students aged 15 or older. Some positions require students to be 15 to 24 or up to 29 for persons with a disability.

21. What is special about Summer Company?

A. It requires no training before employment.

B. It provides awards for running new businesses.

C. It allows one to work in the natural environment.

D. It offers more summer job opportunities. 22. What is the age range required by Stewardship Youth Ranger Program?

C. 15-29.

B. 15-24. D. 16-17.

23. Which program favors the disabled?

C. Stewardship Youth Ranger Program.

A. Jobs for Youth. R Summer Company

D. Summer Employment Opportunities.

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又到大学毕业季。

据悉,近期有大批企业联系山 东畜牧兽医职业学院招聘毕业生 无果,就连该校即将进入实习期 的大二学生也基本被抢订一空。

该校毕业生"好就业、就业 好,能创业"有口皆碑,毕业生深 受用人单位欢迎,一直供不应求。 毕业生就业率连续9年全省领先, 毕业三年后自主创业率近10%。在 2019届毕业生就业双选会上,来 自全国的794家单位为毕业生提 供了31767个就业岗位,供需比例 达1:11,毕业生选择空间很大。毕 业生月收入居(2018全国高职毕 业生月薪排行榜)52位。据麦可思 调查,该校毕业生就业岗位收入、 就业现状满意度与全国骨干校相 比优势明显,就业质量好。

毕业生"好就业,就业好",凭

其一,行业产业前景广阔,人 才需求空间巨大。农业是国民经 济的基础产业,农业农村农民问 题是关系国计民生的根本性间 题。畜牧业作为农业的重要组成 部分,与人类饮食健康、人民生 活水平提高息息相关,是实施乡 村振兴战略的重要内容,发展空 间广阔,具有长青产业特性,人 才需求旺盛

其二,学院教学资源丰富,人 才培养质量高。山东畜牧兽医职 业学院1955年建校,是全国100所 国家示范性(骨干)高职院校之一 是山东省首批16所优质高职院校

建设单位之一,山东省教育厅推 荐的16所中国特色高水平高职学 校和专业建设计划项目申报院校 之一,是教育部"全国大学生[高 职]综合满意度50强"高校。学校拥 有国家级教学名师,国家级教学 团队、国家级重点建设专业、国家 级专业教学资源库、国家级精品 课程,国家级教学成果,校内外实 验实训室、实践基地涵盖所有专 业,优质教育教学资源丰富。在职 业技能大赛,创新创业大赛中屡 获省级,国家级大奖;毕业生升本 读研渠道畅通,就业创业人才辈 出。现在校生1.2万人,是全国最 大的畜牧兽医类人才培养基地。

其三,就业创业教育质量高, 校企融合平台众多。普遍开展就

业创业指导课程,与潍坊创业大 学联合,携手国内知名农牧企 业,共建大学生创新创业教育学 院,实施普训与特训结合的"金 字塔式"创新创业教育。连续10 年成功举办全省高校畜牧兽医 类毕业生就业市场,为毕业生提 供充足的就业岗位 学院着力推进校企合作办

学,开展现代学徒制培养,推进校 企股份合作,产教深度融合,共建 校内实训基地。与国内外500多家 畜牧企业建立了良好的合作关 系,在业内龙头企业设立实习实 训基地360余处。该校校企合作产 教融合工作经验被央视(新闻联 播)占粉。

潜力巨大的产业需求,产教

融合的办学特色,校企合作的育 人模式,造就了山东畜牧兽医职 业学院毕业生供不应求的就业 形势和领先的创业率。 山东畜牧兽医职业学院

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