中国农业大学

2021~2022 学年秋季学期

专业英语能动191 课程考试试题

题号	一	二	三	四	五	六	七	八	总分
得分									

一、Translate the following vocabularies and phrases into Chinese（每题 1 分，共 10 分）

1. Wicket gate: ________________
2. Electrical grids: ____________________
3. Cascade: ____________________
4. Tangential velocity: ________________
5. Positive displacement pump: ___________
6. Exact derivative: ____________________
7. Dimensional consistency:_______________
8. Gauge pressure: _____________________
9. Impulse turbine: ______________________
10. Pumped storage power station: ____

二、Translate the following vocabularies and phrases into English（每题 1 分，共 10 分）

1. 剖视图:______________________
2. 体积流量: _________________________
3. 水头流量曲线: _______________
4. 法向应力: _________________________
5. 惯性力: ____________________
6. 混流泵: ___________________________
7. 汽化潜热: __________________
8. 表面张力: _________________________
9. 可再生能源: _________________
10. 净吸入水头: _______________________

三、Translate the following sentences into English (每句 5 分，共 20 分)

1．流体流经管路时的摩擦阻力以及流体和管壁之间的传热传质速率是建立设计准则的关键参数。

2．通常往复活塞泵的有效流量随着粘度的增加而减小，较高的粘度也会导致泵效率的降低。

3．水轮机是一种从流动的水中获取能量的旋转机械，广泛应用于电力工业。

4．固定导叶的主要功能是承担蜗壳和水轮机顶盖的压力载荷。

考生诚信承诺

1. 本人清楚学校关于考试管理、考场规则、考试作弊处理的规定，并严格遵照执行。

2. 本人承诺在考试过程中没有作弊行为，所做试卷的内容真实可信。

专业：________ 班级：________ 学号：___________姓名：________成绩：_________

四、 Translate the following paragraphs into Chinese (每段 20 分，共 60 分)

1. The molecules of a solid are usually closer together than those of a fluid. The attractive forces between the molecules of a solid are so large that a solid tends to retain its shape. This is not the case for a fluid, where the attractive forces between the molecules are smaller. An ideal elastic solid will deform under load and, once the load is removed, will return to its original state. Some solids are plastic. These deform under the action of a sufficient load and deformation continues as long as a load is applied, providing the material does not rupture. Deformation ceases when the load is removed, but the plastic solid does not return to its original state. The intermolecular forces in a fluid are not great enough to hold the various elements of the fluid together. Hence a fluid will flow under the action of the slightest stress and flow will continue as long as the stress is present. A fluid may be either a gas or a liquid. The molecules of a gas are much farther apart than those of a liquid. Hence a gas is very compressible, and when all external pressure is removed, it tends to expand indefinitely. A gas is therefore in equilibrium only when it is completely enclosed. A liquid is relatively incompressible, and if all pressure, except that of its own vapor pressure, is removed, the cohesion between molecules holds them together, so that the liquid does not expand indefinitely.

2. A new approach to optimizing a pump diffuser is presented, based on a three-dimensional inverse design method and a Computational Fluid Dynamics (CFD) technique. The blade shape of the diffuser was designed for a specified distribution of circulation and a given meridional geometry at a low specific speed of 0.109 (non-dimensional) or 280 (rpm). To optimize the three-dimensional pressure fields and the secondary flow behavior inside the flow passage, the diffuser blade was more fore-loaded at the hub side as compared with the casing side. Numerical calculations, using a stage version of Dawes three-dimensional Navier-Stokes code, showed that such a loading distribution can suppress flow separation at the corner region between the hub and the blade suction surface, which was commonly observed with conventional designs having a compact bowl size (small outer diameter). The improvements in stage efficiency were confirmed experimentally over the corresponding conventional pump stage. The application of multi-color oil-film flow visualization confirmed that the large area of the corner separation was completely eliminated in the inverse design diffuser.

3. The use of hydraulic turbines for the generation of power has a very strong historical traditions. The first truly effective inward flow reaction turbine was developed and tested by Francis and his collaborators around 1850 in Lowell, Massachusetts. Modern Francis turbines have developed into very different forms from the original, but they all retain the concept of radial inward flow. The modern impulse turbine was also developed in the USA and takes its name from Pelton, who invented the split bucket with a central edge around 1880. The modern Pelton turbine with a double elliptic（椭圆形的） bucket including a notch（凹槽） for the jet and a needle control for the nozzle was first used around 1900. The axial flow turbine with adjustable runner blades was developed by the Austrian engineer Kaplan in the period from 1910 to 1924.