



中国专业技术职务评聘英语考试教材

工科分册

(上)

主编 樊 鹏



中国人事出版社

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《工科分册》



于慎波 刘 云

序 言

国家人事部
全国职称考试 指导中心副主任

原 通

随着我国改革开放的顺利推进和社会主义市场经济的不断发展,各项建设事业对人才资源的需求日益增强。在这种新形势下,人事工作应在邓小平同志有中国特色社会主义基本理论指导下,贯彻党的基本路线,按照十四届三中全会确定的市场经济基本框架,着眼于改革开放、经济发展、民族和谐和社会稳定,更好地为经济建设服务,为用人单位服务,为各类人员服务。

根据这一工作方针,如何按照社会经济发展的要求,客观公正评价人才的知识水平和工作能力已成为深化职称改革的重要任务。其中,外语作为专业技术人员学习、借鉴国外先进科学技术和管理经验的一种工具,是职称工作中人才评价的一项重要内容。在这方面,除了建立符合我国实际的有关政策规定以外,还必须有一套科学的评价办法。为此,一些省市和部门对职称外语考试进行了有益的探索。但由于各方面的原因,目前在考试的内容、标准和方法上仍然存在着一些缺陷和不足,特别是缺乏符合专业技术职务评聘工作需要,科学、规范的考试教材。在这种情况下,我很高兴看到由黄凤山主编,中国人事出版社出版的《中国专业技术职务评聘外语考试教材》一书。

虽然由于我不是外语考评方面的专家,很难对这本书的内容、水平、以及适用程度作准确的评价。但从职称考试工作的角度看,这无疑是件好事。基于这一点,我应邀写了上面几句话,以表示对本书出版的祝贺与对有关人员辛勤工作的敬意。同时,以此作为本书的序言。

借此机会,希望社会各方面,特别是有关专家、学者和广大专业技术人员更多地关心、支持职称考试工作,以建立客观、公正的人才评价制度,为我国社会主义建设事业评价和造就大批合格人才。我也希望这套教材,对推进和完善我国专业技术职务评聘外语考试制度,能起到积极的作用。

一九九四年四月于北京

前 言

人事部人职发〔1991〕4号文件《关于在专业技术职务评聘工作中严格掌握外语条件的通知》颁布已经三年了,各地在专业技术职务评聘工作中对外语条件考试、考核的要求,都作了一些有益的探索,这对促进我国专业技术职务评聘外语考试制度的建立,都有积极的意义。但这一工作还不够规范,也不平衡,大部分地区和部门,尚无较实用的考试教材,根据这种情况,为了更好地贯彻执行国家人事部人职发〔1991〕4号文件精神,我们组织编写出版了《中国专业技术职务评聘外语考试教材》。这套教材,共包括英语、日语、俄语三个语种,其中英语考试教材共分六册,包括《文科分册》(含政法)、《理科分册》(含信息管理)、《工科分册》(含工程)、《财经分册》、《农学分册》和《医学分册》。为了使用方便,每一分册又分上、下两册。上册为外文课文100篇(初级30篇、中级30篇、高级40篇)、单词和注释;下册为语法、参考译文及考试样题。教材根据《通知》中“对外语条件既要严格要求,又要实事求是,区别对待”的精神,各地区、各部门对参加专业技术职务评聘的长期坚持在基层、野外或海上从事地质、水利、森林、渔业捕捞等和处在同一系列专业技术职务的老年专业技术人员,应区别对待,可以降低等级参加考试。教材在这方面作了充分考虑,每一等级系列,均由易到难,以便为各种情况下的专业技术人员使用本教材提供方便。

这套教材的编写,得到国家有关部门的大力支持,中央教育和出版的有关部门对书稿进行了认真的审定,人事部全国人事考试中心副主任、人事部全国职称考试指导中心副主任宋小海同志曾对编写工作给予关怀指导并亲自为教材作序,向全国推荐使用。

这套外语考试教材的出版,对于提高我国专业技术人员的外语水平,对促进和完善我国专业技术职务评聘外语考试制度的建立,具有积极的意义。各地区、各部门职改办(考试中心),如果本地区、本部门尚无完备的统一外语考试教材,我们希望能使用这套教材,通过实践,不断使教材质量得到提高,让我们共同携手,积极稳妥地推进我国专业技术职务评聘外语考试工作顺利进行。

这套教材由黄凤山主编,各分册主编,均是国内外语教学界有影响的学者、教授,但因教材资料新、时间紧,不妥甚或错误在所难免,恳请专家、学者以及使用本教材的广大专业技术人员批评指正,以便再版修改。

中国专业技术职务
评聘外语考试教材编委会

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Lesson 1

Keys

The object of a key is to prevent relative rotation between the shaft and the keyed-on member such as a pulley, coupling, or gear. The key consists of a piece of metal so placed that it is embedded partly in the shaft and partly in the keyed-on member. The square key consists, as its name indicates, of a piece of coldrolled or drawn steel square in cross-section, placed so that one half is embedded in the shaft and one half in the hub of the keyed-on member. The flat key is similar to the square key, but its thickness is less than its width. Both types are widely used in machine-tool and line-shaft work. They should fit the keyways in both the shaft and hub accurately on the sides but they need not bear tightly top and bottom. Where a very tight fit is desired to effect resistance to vibration which might cause the key to work out of its keyway, a taper key is used^①. This is similar to the square key, but is made thicker at one end than at the other. The larger end is usually fitted with a gib head to facilitate ready removal of the key when occasion demands. A taper key acts as a wedge and may be driven in too tightly. It requires accurate fitting on all four sides and is likely to throw the keyed-on member off center^② unless the fit between the shaft and hub is a good one. The Woodruff key permits the use of a taper keyway without requiring great accuracy, because the key may pivot in its seat and align its flat face with that of the tapered keyway^③. It is used only for light work and requires that the keyed-on member be slipped over it.

New Words

accurate fitting 精密配合

bear *vt.* 支承, 负担

cold rolled steel 冷轧钢

effect *n.* 效果, 影响 *vt.* 引起, 达到

fit *vt.* 配合 *n.* 配合

hub *n.* 轮毂

keyed-on member 键上装的零件

occasion *n.* 有时, 时节

pivot *vi.* 旋转 *n.* 枢轴

taper key *n.* 斜键

align *vt.* 对准

cold draw steel 冷拨钢

cross-section *n.* 横截面

embed *vt.* 包裹, 镶嵌

gib head key 钩头键

keyway *n.* 键槽

line-shaft *n.* 天轴, 总轴

off center 偏离中心

wedge *n.* 楔

Woodruff key 伍氏键, 月牙键

Notes

① Where a very tight fit is desired to effect resistance to vibration which might cause the key to work out of its keyway, a taper key is used.

to effect resistance to vibration 是 tight fit 的形容词短语, effect resistance 实现阻力; which

是 vibration 的代词,是振动使键从键槽 work out, taper key 打入而达到 very tight fit 便能抗拒振动而不脱出了。

②...and is likely to throw the key-on member off center...

由于斜键的一端厚度大,而且顶及底也接触,便可能将套在键上的零件往外挤得偏离中心。

③The Woodruff key permits the use of a taper keyway without requiring great accuracy, because the key may pivot in its seat and align its flat face with that of the tapered keyway. 这是一个复合句。前面子句中 Woodruff key 是主语,它允许采用斜键槽而不需要高精度;后面子句中 key 是主语,may pivot 是动词,因为它在轴上的键槽,即 seat,是半圆形的,所以半圆形的月牙键在此键槽中以圆弧面接触而转动;最后一子句的主语仍是 key,用 and 与上一子句并联,动词是 align...with,that 是 flat face 的代词,指斜键槽(在轮毂内锥孔中)中的平面,将伍氏键的平面(上面)与斜的键槽的平面(槽底)对准。

Lesson 2

Washers and Lock Washers

Most screw fasteners are tensile devices sensitive to bending loads. Washers are often used with threaded fasteners to provide a better bearing surface for nuts and bolt heads, to provide a bearing surface over large clearance holes or slots, to distribute the load over a larger area, to prevent marring of parts during assembly, to improve torque-tension ratio (by reducing friction), and to provide locking, in some cases through spring action^①. Flat washers are thin, annular-shaped disks used primarily for bearing surface and load distribution and have no locking capability. Conical spring washers are made of hardened and tempered steel that is slightly dished^②. Conical washers deform when the bolt is tightened and act as springs that compensate for^③ small losses in bolt tension due to thermal expansion or compression set of the gaskets. Helical spring lockwashers are essentially single-coil helical springs^④ that flatten under load. Spring action assists in maintaining the bolt load, while split edges provide some locking action by biting into the bearing surfaces. These lockwashers are generally made of hardened steel or bronze and aluminum alloys.

Toothed lockwashers provide locking action by biting into the material of the bolt head or nut and the surface of the connected part. Gripping action results from the teeth being deformed axially. Usually made of hardened steel, they provide the best locking action of any lockwasher of comparable size. The external toothed lockwasher is the most commonly used type, although internal toothed lockwashers may be used where appearance is important. When the clearance hole is large, internal-external toothed lockwashers may be used; internal teeth grip the bolt head or nut and external teeth span the clearance hole to grip the work piece.

New Words

aluminum <i>n.</i> 铝	annular-shaped 环状
assembly <i>n.</i> 装配	assist <i>vt.</i> 帮助
bearing surface 支承表面	biting <i>pp.</i> bite 的分词, 咬住
bronze <i>n.</i> 青铜	capability <i>n.</i> 能力
clearance <i>n.</i> 间隙	compensate <i>vt.</i> 补偿
compression <i>n.</i> 压缩	conical <i>a.</i> 锥形的
deform <i>vi.</i> 变形	distribute <i>vt.</i> 分布, 分配
edge <i>n.</i> 边缘	essentially <i>ad.</i> 本质地, 基本上
expansion <i>n.</i> 膨胀	flatten <i>pp.</i> 使平
friction <i>n.</i> 摩擦	gasket <i>n.</i> 密封用垫片
harden <i>v.</i> 淬硬	improve <i>vt.</i> 改进
lock <i>v.</i> 锁住	loss <i>n.</i> 松动
maintain <i>vt.</i> 保持	reduce <i>vt.</i> 减小
marr <i>vt.</i> 胶结, 连接	screw fastener 螺钉紧固件
sensitive <i>a.</i> 灵敏的	slightly <i>ad.</i> 略为, 稍稍
slot <i>n.</i> 槽	split <i>vt.</i> 分裂, 分开
spring action 弹簧作用	temper <i>vt.</i> 回火
tensile device 受拉伸的装置	thermal <i>a.</i> 热的
threaded fastener 螺纹紧固件	through <i>prep.</i> 通过, 经
torque-tension ratio 扭拉比	dish <i>n.</i> 碟 <i>vt.</i> 成中凹的碟形
grip <i>vt.</i> 扣住, 抓紧	comparable <i>a.</i> 可比的

Notes

- ① Washers are often used with threaded fasteners to provide..., to provide..., to distribute..., to prevent..., to improve..., and to provide...
这许多不定式都说明垫圈配合螺纹紧固件能起的作用。
- ② ...are made of hardened and tempered steel that slightly dished.
锥形弹簧垫圈由淬硬而且回火的钢制成。
that 是 washer 的代词, 略被压成碟形。
- ③ that compensate for...: 补偿由于热膨胀或垫片压缩而发生的螺栓拉力小量松动。
- ④ single-coil helical springs: 单圈螺旋弹簧。

Lesson 3

Early Work in AI

As noted above, AI^① began to emerge as a separate field of study during the 1940s and 1950s when the computer became a commercial reality. Prior to this time, a number of impor-

tant areas of research that would later help to shape^② early AI work were beginning to mature. These developments all began to converge during this period. First, there was the work of logicians such as Alonzo Church, Kurt Godel, Emil Post, and Alan Turing. They were carrying on^③ earlier work in logic initiated by Whitehead and Russell, Tarski, and Kleene. This work began in earnest^④ during the 1920s and 1930s. It helped to produce formalized methods for reasoning, the form of logic known as propositional and predicate calculus^⑤. It demonstrated that facts and ideas from a language such as English could be formally described and manipulated mechanically in meaningful ways^⑥. Turing, sometimes regarded as the father of AI, also demonstrated, as early as 1936, that a simple computer processor (later named the Turing machine) could manipulate symbols as well as numbers.

Second, the new field of cybernetics, a name coined by Norbert Wiener, brought together many parallels between human and machine^⑦. Cybernetics, the study of communication in human and machine^⑧, became an active area of research during the 1940s and 1950s. It combined concepts from information theory, feedback control systems (both biological and machine), and electronic computers.

Third came the new developments being made in formal grammars. This work was an outgrowth of logic during the early 1900s^⑨. It helped to provide new approaches to language theories in the general field of linguistics.

New Words

AI=artificial intelligence 人工智能

separate field 独立领域

commercial *a.* 商业的

prior *a.* 在先的

shape *vt.* 使成形, *n.* 形状

converge *vi.* 会聚, 集中

logician *n.* 逻辑学家

initiate *vt.* 发起, 创始

earnest *n.* 预示 *a.* 认真的

reasoning *presp.* 推理

predicate *n.* 论断

predicate calculus 推断运算学

fact *n.* 事实

language *n.* 语言

describe *vt.* 叙述

mechanically *ad.* 机械地

regarded as 被认为

cybernetics *n.* 控制论

as well as 一样

communication *n.* 通讯, 信息

concept *n.* 思想, 概念

feedback *n. vt.* 反馈

biological *a.* 生物学的

formal grammar 正式语法

provide *n.* 提供

theory *n.* 理论

later *ad.* 后来

emerge *vi.* 呈现出, 显露

computer *n.* 计算机

reality *n.* 现实, 真实事物

mature *vt.* 成熟, 成长

a number of 几个

development *n.* 发展

period *n.* 时期

carry on 进行

logic *n.* 逻辑学

formalized method 成形程序

propositional *a.* 提议, 命题

calculus *n.* 微积分

demonstrate *vt.* 指出

idea *n.* 观念
 formally *ad.* 形式上,正式地
 manipulate *n.* 运作,操纵
 meaningful *a.* 有意义的
 computer processor 计算机处理器
 symbol *n.* 符号
 parallel *a.* 平行的 *n.* 类比,相似
 coin *vt.* 编造,造(字)

active *a.* 活跃的
 information theory 信息论
 control system *n.* 控制系统
 electronic computer 电子计算机
 outgrowth *n.* 增生,枝条
 approach *n.* 方法,手段
 linguistics *n.* 语言学

Notes

- ① AI=Artificial Intelligence; 人工智能。
- ② ...that would later help to shape...
 后来有助于形成……的。
 that 是连接词,引出定语从句以修饰几个重要的科研领域;shape 在此作动词“成形”解;to shape 构成不定式。
- ③ They were carrying on...他们进行着……。这是过去进行式,carry on 意为从事、进行着。
- ④ ...in earnest 预示着。earnest 在此为名词作介词 in 的宾语。因为工作在早期,所以是预先表现为……。
- ⑤ ...formalized methods...calculus. 这是逻辑学的程序,命题、推理、论断。
- ⑥ ...that facts and ideas...in meaningful ways.
 that 引导一个从句作 demonstrated 的宾语,从句中 facts 及 ideas 是主语,could be described and manipulated 是谓语。正式地叙述机械地操作而是有意义的方式。
- ⑦ ...brought together...human and machine.
 将人类的及机器的许多类似处汇集在一起。谓语是 brought;parallels 在此是名词作宾语,指相似处、类比处;between human and machine 是介词短语,作 parallels 的定语。
- ⑧ ...the study of communication in human and machine, 人机对话的研究。这是一个插入短语作 cybernetics 控制论的定义。
- ⑨ ...an outgrowth of logic during the early 1900s.
 在二十世纪初是逻辑学的一个分支。
 outgrowth 原意是增生,枝节,不认为是主体部分的,后来却独立成一门科学了。

Lesson 4

Classification of Analytical Methods According to the Properties of Substances

Depending on the property measured, analytical methods are classed into chemical, physicochemical, and physical methods.

Chemical methods rely on analytical chemical reactions. Identification methods involve reactions producing conspicuous external effects; formation of precipitates or coloured solutions, gas evolution, changing of colour of the material being analysed. In quantitative analysis, chemical reactions aid in measuring the amount of the reaction product or of the reagent consumed^①.

Physicochemical analytical methods are concerned with the measurement of certain physical parameters of a chemical system that are dependable on the nature of the system components and vary in the process of the reaction^②. These parameters include potential values in potentiometry, optical densities of coloured complexes in spectrophotometry, etc. Quantitative analysis is based on the existence of definite relationships between the value of the physicochemical quantity measured and the concentration of the desired component^③ in the sample being analysed. These dependences are usually expressed mathematically as the corresponding laws.

Physical analytical methods do not use chemical reactions. The composition^④ of a substance is determined by measuring characteristic physical properties of material (such as density, viscosity, surface tension of solutions) or its components. Spectral analysis is one of the most widely used physical methods of analysis.

New Words

conspicuous *a.* 显眼的, 突出的
 quantitative analysis 定量分析
 reaction *n.* 反应
 distort *vt.* 扭曲
 complex *n.* 复合物
 spectrophotometry *n.* 分光光度计
 physicochemical *a.* 物理化学的
 according to 根据
 involve *vt.* 包括
 analytical method. 分析方法
 process *n.* 过程, 工序
 identification *n.* 认同, 辨认
 formation *n.* 形成, 构成
 coloured *a.* 有色的
 measurement *n.* 测量, 检测
 nature *n.* 性质, 自然
 potential value 电位值
 density *n.* 密度
 definite *a.* 一定的, 规定的
 sample *n.* 试样
 law *n.* 法律, 定律

corresponding *a.* 相应的
 characteristic *a.* 特征的
 surface tension 表面张力
 material *n.* 物质
 evolution *n.* 发展, 长大
 reagent *n.* 试剂, 反应物
 consume *vt.* 消耗, 用掉
 potentiometry *n.* 电位计
 dependence *n.* 依靠, 关系式
 concentration *n.* 浓度
 chemical *a.* 化学的
 classification *n.* 分类
 rely *vi.* 依赖
 substance *n.* 物品, 东西
 chemical reaction 化学反应
 external *a.* 外面的
 precipitate *n.* 沉淀 *vi.* 沉淀
 solution *n.* 溶液
 parameter *n.* 参数
 component *n.* 成分, 分量
 optical *a.* 光学的

existence *n.* 存在
relationship *n.* 关系式
express *vt.* 表示
mathematically *ad.* 数学上地

composition *n.* 含量,成分,组成
viscosity *n.* 粘度
spectral analysis 光谱分析

Notes

- ①...chemical relation aid in measuring the amount of the reaction product or the reagent consumed...

化学反应帮助测定反应产物的量或试剂的消耗量。

句中谓语是 aid,常和 in 连用;measuring 作为动名词,既是介词 in 的宾语,又有 amount 作为它的宾语;后面有二个 of 引导的介词短语并行地修饰 amount。

- ②...that are dependable on the nature of the system components and vary in the process of the reaction.

它取决于系统成分的性质并在反应过程中变化。

在这里连接词 that 引导出一个定语从句修饰化学系统中的物理参数。system components 指这个化学系统中所含的各种成分,是 nature 的定语。这个定语从句中 that 是主语,谓语有二个,即 are 与 vary 分别引出其后的介词短语。

- ③...the concentration of the desired component...

所要的成分的浓度。试样中含有各种成分,定量分析的目的是要测定其中某一种成分的含量,所以说“所要的成分”。

- ④composition;成分、组成。本文中 component 与 composition 在简单字典中都解释为成分、组成。其实概念有区别:component 指系统中某一种成分或某一个单元,而 composition 指系统由各种成分所组成,或理解为“含有××及××等成分”。

Lesson 5

Acids, Bases and Salts

Substances possessing a sour taste^① all contain compounds known as acids. All acids share the same characteristics: (a) they all taste sour, (b) they turn litmus paper red, (c) something happens when they meet most metals and they set free hydrogen gas, and (d) when they are dissolved in water, they set free positively-charged particles known as hydrogen ions. An acid which is often found is hydrochloric acid (written like this in chemistry: HCl).

The substances possessing opposite characteristics to the characteristics of acids, are known as bases. If a base is soluble in water, it is called an alkali^②. Bases turn litmus paper blue, and when they are dissolved in water, they set free hydroxyl ions. A hydroxyl ion is made up of an atom of oxygen joined together with an atom of hydrogen. Because it carries one extra electron, it is negatively charged. A base which is often found is sodium hydroxide (written like this in chemistry: NaOH).