

## **Global Business Education Comprehensive Exam Summary:**

### *Undergraduate Level*

Peregrine Academic Services (PAS) provides assessment services for performing direct assessment of learning outcomes in a range of academic disciplines. The online exams are used to evaluate retained student knowledge in relation to the academic program's learning outcomes.

**This document outlines the Global Business Education assessment service for associate and bachelor's academic degree levels.**

The assessment service is designed for use by schools and programs outside the US.

PAS places a high priority on ensuring the validity and reliability of the assessment services. These practices begin at the design stage and continue through beta-testing, and with ongoing regularly scheduled quality reviews. A description of the approach used to ensure ongoing validity and reliability is provided at the end of this document.

The undergraduate test bank of questions is used for both associate and bachelor's levels because:

- a) The questions are associated with foundational knowledge levels.
- b) Using the same test bank for both associate and bachelor's level testing is an accreditation/articulation requirement for undergraduate transfer students completing a degree program at the associate level and continuing forward with a bachelor's program.

When used for the associate and bachelor's degree exams, the academic program manager selects topics that align with their learning outcomes and the program curriculum (usually 4-6 topics per exam for the associate degree and 10-12 topics for the bachelor's).

The test material has been translated into French, German, Mongolian, Portuguese, Russian and Spanish.

This document provides information on:

- Topics and sub-topics where applicable, and the subjects covered within each topic or sub-topic.
- Example questions.
- Assessment Service Validity and Reliability.

The Topics and Sub-Topics are:

1. Accounting
2. Business Ethics
3. Business Finance
4. Business Integration and Strategic Management
5. Business Leadership
6. Economics
  - a. Macroeconomics
  - b. Microeconomics
7. Global Dimensions of Business
8. Information Management Systems
9. Legal Environment of Business

10. Management
  - a. Human Resource Management
  - b. Operations/Production Management
  - c. Organizational Behavior
11. Marketing
12. Quantitative Research Techniques/Statistics

## **Topic: Accounting**

### **Subjects**

- Accounting Management (*Questions related to accrual accounting, revenues and expenses, the balance sheet, and inventory accounts*)
- Assets and Liabilities (*Questions related to accounts receivable, write-offs, collectable accounts, and buyer's records*)
- Balance Sheet (*Questions related to time frames associated with balance sheets, the statement of financial position, accounts receivable, and valuation of inventories*)
- Business Organization Types (*Questions related to forms of business organizations*)
- Capital (*Questions related to paid-in-capital, value of stock, distributions of earnings, and par value*)
- Debit and Credit Entries (*Questions related to accounts receivable, transactions, last in first out, first in first out, and notes receivable*)
- Fiscal Year (*Questions related to the firm's operating cycle, equity balance sheet, assets, owner's equity, and liabilities*)
- Income and Costs (*Questions related to inventory cost flow assumption, balance sheet inventories, cash balances, and general ledger accounts*)
- Income Statement (*Questions related to revenues, gains, expenses, and losses*)
- Revenues and Expenses (*Questions related to operating activities, net assets, cash disbursements, and common stock*)
- Transaction Analysis (*Questions related to matching revenue and expenses, notes payable, reconciliation, and adjustments*)

### **Example Questions**

The beginning inventory of the current year is overstated by €5,000 and closing inventory is overstated by €12,000. These errors will cause the net income for the current year to be \_\_\_\_\_.

- A. overstated by €17,000
- B. understated by €12,000
- C. overstated by €7,000
- D. understated by €7,000

**Correct Response: C**

There are five main types of current assets. Which one of the following is not a current asset?

- A. Cash and equivalents
- B. Accounts receivable
- C. Deferred income
- D. Prepaid expenses

**Correct Response: C**

## **Topic: Business Ethics**

### **Subjects**

- Ethical Beliefs (*Questions related to ethical ideas, employee benefits, cross-cultural contradictions, ethical relationships, and ethical guidelines*)
- International Regulation (*Questions related to global code of conduct, monopolies, harmonization statutes, and laws and regulations*)
- Shareholders (*Questions related to maximum profits, and policies*)
- Social Responsibility (*Questions related to human rights, positive reputation, stewardship, and ownership theory*)
- Stakeholder Analysis (*Questions related to international coalitions, communications technology, stakeholder relationships, nonmarket stakeholders, stakeholder groups, and stakeholder management*)

### **Example Questions**

An ethical issue is a problem, situation, or opportunity \_\_\_\_\_.

- A. that has no correct answer
- B. requiring an individual, group, or organization to choose among several actions that must be evaluated as right or wrong, ethical or unethical
- C. requiring an individual, group, or organization to choose between harming consumers or the environment and earning more profits
- D. requiring society as a whole to choose among several actions that must be evaluated as right or wrong

**Correct Response: B**

An ethical investor is one who \_\_\_\_\_.

- A. aims to invest in ethical corporate behaviour and avoid unethical companies
- B. supports the giving of corporate money to charities
- C. supports company growth and full employment
- D. sells ethical stocks and shares portfolios to investors

**Correct Response: A**

## **Topic: Business Finance**

### **Subjects**

- Business Ownership (*Questions related to the forms of business structure, capital structure, stockholders, and corporate governance*)
- Capital Costs (*Questions related to capital structure, leverage, and the cost of capital*)
- Debt-to-Equity Ratio (*Questions related to the return on equity, the cost of capital, asset turnover, and profit margin*)
- Equity (*Questions related to the increase in risk, financial leverage, and debt-equity ratio*)
- Financial Leverage (*Questions related to capital structure*)
- Financial Personnel (*Questions related to shareholders' interests, financial managers, and compensation*)
- Financial Planning (*Questions related to long-term financial planning, desired levels of growth, and investment activities*)
- Financial Ratios (*Questions related to financial information, comparison statements, and solvency*)
- Financial Statements (*Questions related to financial statements, and projected future financial statements*)
- Interest (*Questions related to tax shields, required rate of return, capital structure, net cost of debt, and the cost of equity*)
- Profit Margins (*Questions related to sustainable growth, stocks, profit margin, asset requirement ratio, dividend payout ratio*)
- Ratio Analysis (*Questions related to quick ratio, current ratio, sustainable growth, total asset turnover ratio, operating costs, and the cash flow position*)
- Stocks and Bonds (*Questions related to the stock valuation model, current stock prices, annual dividend, and corporate bonds*)

### **Example Questions**

John is a major shareholder of a company. He is quite upset with the firm's management and thus has decided to try and gain control of the firm by soliciting enough shareholder votes to replace the current managers. Which one of the following terms is used to describe this attempt?

- A. Going private
- B. Proxy contest
- C. Stock swap
- D. Leveraged buyout

**Correct Response: B**

Blue Ocean Tours has a cost of equity of 14.28 percent and a pre-tax cost of debt of 8.1 percent. The debt-equity ratio is 0.60 and the tax rate is 34 percent. What is the firm's unlevered cost of capital?

- A. 9.80 percent
- B. 12.53 percent
- C. 13.10 percent
- D. 14.10 percent

**Correct Response: B**

## **Topic: Business Integration and Strategic Management**

### **Subjects**

- Business Level Strategy (*Questions related to what businesses compete in, and how businesses can be managed to achieve synergy*)
- Buying Power (*Questions related to bargaining power, undifferentiated and standard products, and distribution channel intermediaries*)
- Competitive Intelligence (*Questions related to information gathering from public domains, and sources of information*)
- Corporate Structure and Governance (*Questions related to assessing changes competitive position, human resource management, business models, and the marketing department*)
- Employee Motivation (*Questions related to the focus of responsibility, and departmental output*)
- Entry Behaviors (*Questions related to costs, exit barriers, access to raw materials, economies of scale, and capital requirements*)
- Environmental Monitoring (*Questions related to sociocultural changes in the environment, new entrants, environmental trends, and the environmental scanning process*)
- Goals and Objectives (*Questions related to changes in strategy, short-term profit maximization, and social responsibility*)
- Inventory Management (*Questions related to inventory systems*)
- Market Entry (*Questions related to complementary products, substitute products, and market changes*)
- Mission and Vision (*Questions related to competition and competitive advantage, hierarchy of goals, the organization's purpose and direction*)
- Stakeholder Analysis (*Questions related to a firm's stakeholders*)
- Value Chain Analysis (*Questions related to sustainable advantages, enhancing a firms' capabilities, manufacturing operations, and business models*)

### **Example Questions**

Buyer power is high if \_\_\_\_\_.

- A. differentiation is low
- B. switching costs are high
- C. buyers have little information
- D. access to distribution channels is difficult

**Correct Response: A**

Successful business relationships tend to \_\_\_\_\_.

- A. combine relational contracts - to build trust in the long term - with transactional contracts to cover specific situations
- B. depend upon tightly written legal contracts that take account of every potential problem or issue
- C. rely upon firms being able to trust their employees and partners
- D. be treated as finite games that both parties know will end sooner or later

**Correct Response: A**

## **Topic: Business Leadership**

### **Subjects**

- Leader Roles and Responsibilities (*Questions related to the leadership process, the psychological perspective of leadership, leadership tools, and the components of leadership*)
- Leader-Follower Relationships (*Questions related to group consent, status, types of followers, and the relationship process*)
- Leadership Models and Theories (*Questions related to the social construct of leadership, group-emergent leadership, influence, and status*)
- Reward and Punishment (*Questions related to group cohesion, contingencies, perception, and behavior*)
- The Nature of Leadership (*Questions related to personality and traits, and leadership qualities*)
- Types of Power (*Questions related to conformity, legitimate power, legitimizing basis of power, and combinations of power*)

### **Example Questions**

With the rapid dispersion of information technology and communication, leaders are being forced to deal with followers who may be working in another part of the world. Which one of the following is true in so far as online leadership is concerned?

- A. Effective online leaders need to develop the skill of deciphering the emotional components of messages.
- B. The digital age can never transform non-leaders into leaders.
- C. Managers whose face-to-face leadership skills are less than satisfactory can shine online.
- D. The online leader has received considerable attention from leadership experts.

**Correct Response: A**

Studies have found that successful top executives differ significantly from the general population in terms of a certain personal characteristic. The difference has also been found to be linked to organizational effectiveness. Which one of these is the identified personal characteristic of successful top executives?

- A. Greater emotional intelligence
- B. More ambition
- C. Higher Intelligence Quotient (IQ)
- D. Charismatic personality

**Correct Response: A**

## **Topic: Economics**

### **Sub-Topic: Macroeconomics**

#### **Subjects**

- Business Cycle (*Questions related to what the business cycle depicts*)
- Consumption and Saving (*Questions related to investment vs. consumption, disposable income, and savings*)
- Economic Analysis (*Questions related to short-run vs. long-run, investment spending, increasing investment, and inventory levels*)
- Economic Investment (*Questions related to defining economic investment and investing in capital*)
- Employment Analysis (*Questions related to unemployment and employment rates*)
- Gross Domestic Product (*Questions related to economic growth rates, real GDP, and moderate economic growth*)
- Inflation and Deflation (*Questions related to the rate of inflation or deflation*)
- Interest Rates (*Questions related to real interest rates, level of investment, and defining real interest rates*)
- Recession and Depression (*Questions related to the definitions of recession and depression*)
- Supply and Demand (*Questions related to investment demand curve and demand shocks*)

#### **Example Questions**

Which of the following is not part of the real business cycle explanation of business cycles?

- A. Wage flexibility keeps output close to its potential level.
- B. Output fluctuates because of fluctuations in aggregate supply.
- C. Aggregate supply fluctuates because of fluctuations in the demand for labour.
- D. Labour demand might fall if technology increases faster than expected.

**Correct Response: D**

There are many reasons why a poor country may fail to catch up with a rich neighbour. Which one of the following is not one of these reasons?

- A. The poor country may have more rapid population growth.
- B. The rich country may have more human capital.
- C. The poor country may have a higher savings ratio.
- D. The rich country may be more open to the world economy.

**Correct Response: C**



## Sub-Topic: Microeconomics

### Subjects

- Economic Analysis (*Questions related to methods and tools used for economic analysis*)
- Employment Analysis (*Questions related to minimum wage and price elasticity*)
- Pricing (*Questions related to increases and decreases in pricing based on demand and the relationship between supply and demand on pricing*)
- Supply and Demand (*Questions related to supply curves, producer surplus, consumer surplus, demand curves, and price elasticity*)

### Example Questions

A firm charges \$14 for a product. If the mark-up is 40%, then the fully allocated average cost is

\_\_\_\_\_.

- A. \$19.60
- B. \$10.00
- C. \$8.40
- D. \$9.00

**Correct Response: B**

An increase in price, with all other things being unchanged, leads to \_\_\_\_\_.

- A. an outward shift in demand
- B. an inward shift in demand
- C. a contraction of demand
- D. an extension of demand

**Correct Response: C**

## **Topic: Global Dimensions of Business**

### **Subjects**

- European Union (*Questions related to the economic and monetary union, and common foreign policy*)
- Global Market Analysis (*Questions related to foreign operations, global business perspectives, and foreign operations*)
- Globalization (*Questions related to the drivers of globalization, environmental forces, free trade, and environmental conditions*)
- International Business Structures (*Questions related to foreign forces, transnational corporations, the environments of international business, and exports*)
- International Environment (*Questions related to the external environment, influencing behavior, behavioral reactions, and decision making*)
- International Trade (*Questions related to the impact of political issues*)
- United Nations (*Questions related to global and regional solutions, the Security Council, the five main bodies/organs*)
- World Trade Organization (*Questions related to trade unions*)

### **Example Questions**

Globalization is beneficial to firms because \_\_\_\_\_.

- A. it protects them from foreign competition
- B. it cushions them from the effects of events in other countries
- C. it increases the risk and uncertainty of operating in a globalizing economy
- D. it opens up new market opportunities

**Correct Response: D**

\_\_\_\_\_ are situations in which the domestic firm assumes an equity position (partial ownership) in a foreign firm to manufacture and / or market the domestic firm's product offerings.

- A. Direct investments
- B. Joint ventures
- C. Franchise relationships
- D. Strategic alliances

**Correct Response: B**

## **Topic: Information Management Systems**

### **Subjects**

- Computer Integrated Manufacturing (*Questions related to agile manufacturing, the automation of manufacturing, and outsourcing/off-shoring*)
- Decision Support Systems (*Questions related to tactical management, information systems, data mining, analytical processing, and strategic information systems*)
- E-Commerce (*Questions related to intranets and extranets, the cross-functional enterprise system, and the integrated suite of software modules*)
- Electronic Communications (*Questions related to supply chain management, enterprise collaboration systems, and demand forecasts*)
- Information Systems (*Questions related to internet technologies, functional business systems, the marketing business function, and manufacturing information systems*)
- Internal and External Networks (*Questions related to internet/intranet websites, and interactive marketing*)
- Knowledge Management Systems (*Questions related to composite and cross-functional capabilities, strategies of an enterprise and the development of computer systems*)
- Knowledge Workers (*Questions related to the use and distribution of information*)
- Software and Hardware (*Questions related to data resource management technologies, the development, access and maintenance of databases*)
- Technology Management (*Questions related to the management of development efforts, and analysis of the effectiveness of new information systems*)

### **Example Questions**

Which one of the following is characteristic of a Decision Support System (DSS)?

- Provides guidance in identifying problems, finding and evaluating alternative solutions, and comparing or selecting alternatives.
- Draws on diverse yet predictable data resources to aggregate and summarize data.
- High volume data capture process.
- Has as its goal the efficiency of data movement, processing and interfacing different Transaction Processing Systems (TPS).

**Correct Response: A**

Which one of the following terms is used to describe information coming into a computer that is in bad form, or is incorrect, and will adversely affect the decision-making process?

- Garbage In Garbage Out (GIGO)
- Tainted data
- Dirty information
- Scrubbed data

**Correct Response: A**

## **Topic: Legal Environment of Business**

### **Subjects**

- Administrative Agencies (*Questions related to powers of administrative agencies, various administrative procedures, and regulations*)
- Criminal Law (*Questions related to negligence, intentional wrongdoing, intentional torts, common defense, disenfranchisement, double jeopardy, and evidence*)
- Cyber-crime (*Questions related to commercial service providers, cyber trespass, online activities, and electronic communications*)
- Damages and Punishment (*Questions related to punitive damages, intangible harms, compensatory damages and emotional distress*)
- Due Process (*Questions related to fundamental rights, rational basis analysis, substantive due process, reasonable notice, and right to a hearing*)
- Legal Analysis (*Questions related to strict scrutiny analysis, and government action*)
- Liability (*Questions related to strict liability, personal liability, assumption of risk, basic principles of causation, and statutory requirements*)
- Privacy Law (*Questions related to invasion of privacy, and consent*)
- Public Use (*Questions related to the power of eminent domain, and seizure*)
- Tort (*Questions related to defamation, intentional tort, abuse of process, and malicious prosecution*)

### **Example Questions**

Equality before the law is rendered meaningless if \_\_\_\_\_.

- A. judges have sentencing discretion to take into account individual case facts
- B. an individual cannot access the legal system because it is prohibitively expensive
- C. everyone cannot afford legal representation of the same standard
- D. the possibility to appeal a case decision ends

**Correct Response: B**

Fred finds George's lost dog. George is so pleased he promises to give Fred \$350. George fails to give Fred the \$350 promised. Can Fred enforce the promise?

- A. Yes, because Fred did something in return for the \$350.
- B. Yes, because it is a unilateral contract.
- C. No, because the promise to pay was made after the act in returning the dog and past consideration is not good consideration.
- D. No, because the dog was worth only \$50.

**Correct Response: C**

## **Topic: Management**

### **Sub-Topic: Human Resource Management**

#### **Subjects**

- Employee Development (*Questions related to differentiation strategies and employee development processes*)
- Job Analysis (*Questions related to data gathering for job analysis, employee activities and outcomes, and job application processes*)
- Organizational Structure (*Questions related to (downsizing and restructuring)*)
- Personnel Planning (*Questions related to employee recruiting, forecasting, planning processes, and labor shortage or surplus*)
- Strategic Management (*Questions related to steps in strategic personnel planning, personnel decision-making, and types of employment strategies*)

#### **Example Questions**

The final process of a job analysis is the preparation of two statements, namely, \_\_\_\_\_.

- A. job observation and job description
- B. job specification and job observation
- C. job description and job specification
- D. job specification and job requirements

**Correct Response: C**

Why is it important to ensure that Human Resource (HR) plans are flexible?

- A. Why is it important to ensure that Human Resource (HR) plans are flexible?
- B. To accommodate the rapidly changing environments in which most organisations operate.
- C. To adapt to changing skills and qualifications.
- D. To ensure a diverse work force is maintained at all times.

**Correct Response: B**

### **Sub-Topic: Operations/Production Management**

#### **Subjects**

- Management Design (*Questions related to flow processes, primary functions, production vs. operational management, process selection, and throughput*)
- Organizational Structure (*Questions related to office design*)
- Product Development (*Questions related to new product development, design for manufacturing, and market pull*)
- Supply Chain Management (*Questions related to infrastructure improvement, supply chain activities, supply chain dynamics, set-up time, an labor and overhead costs*)

#### **Example Questions**

Which one of the following is not a factor that affects productivity?

- A. Flat organizational structures
- B. Design of the workspace
- C. Standardizing processes
- D. Wireless cellular phones

**Correct Response: D**

Activities that are undertaken before the final operation are termed \_\_\_\_\_ activities.

- A. upstream
- B. primary
- C. secondary
- D. downstream

**Correct Response: A**

### **Sub-Topic: Organizational Behavior**

#### **Subjects**

- Employee Development (*Questions related to task performance, employees and organizational goals, job demand responses, political deviance, work output, and employee obligations*)
- Management Design (*Questions related to discretionary activities and quality of the workplace design*)
- Personnel Planning (*Questions related to workplace stress, employee attitude, employee behaviors, and work-life balance*)

#### **Example Questions**

The concept of Communities of Practice (CoP) has grown in the past decade and can evolve formally or informally using communication and information technology. What is an appropriate description of a CoP?

- A. A gathering of experts in a particular field who allow their work to be disseminated over the internet.
- B. An individual who is willing to disseminate relevant information to interested parties.
- C. Groups of people who interact regularly on issues important to them and share best practices for their mutual benefit.
- D. A workplace based group willing to communicate with others using the internet and the intranet.

**Correct Response: C**

The first step in the recruitment and selection process is \_\_\_\_\_.

- A. trend analysis
- B. application form
- C. succession planning
- D. employment (personnel) planning

**Correct Response: D**

## **Topic: Marketing**

### **Subjects**

- E-Commerce (*Questions related to internet-based collaborators, producers, service providers, intermediaries, and manufacturers*)
- Market-Driven Economy (*Questions related to economic systems, marketing activities, and profit*)
- Marketing Analysis (*Questions related to non-profit organizations, measuring profit, types of customers, product market, and market segmentation*)
- The Marketing Function (*Questions related to e-commerce, collaboration, intermediaries, and market-driven economy*)

### **Example Questions**

The ultimate objective of a company's website is to add enough value to achieve \_\_\_\_\_, a state in which the customer has a vested interest to stay with the company because switching to a competitor entails significant costs.

- A. loyalty
- B. a dependency relationship
- C. lock-in
- D. integration

**Correct Response: C**

What are the four Ps of the marketing mix?

- A. Plan, Price, Publicize, Promote
- B. Price, Place, Product, Promote
- C. Product, Price, Promote, Place
- D. Product, Promote, Place, Pay

**Correct Response: C**

## **Topic: Quantitative Research Techniques and Statistics**

### **Subjects**

- Descriptive Statistics (*Questions related to mean, numeric characteristics, median, qualitative data, and mode*)
- Displaying Results (*Questions related to graphs, frequency tables, graphical tools, and statistical tools*)
- Population Analysis (*Questions related to units*)
- Sampling (*Questions related to systematic samples, units, and random samples*)
- Scales of Measurement (*Questions related to population unit, levels of measurement, data sets, and frequency distribution*)
- Statistical Analysis (*Questions related to quantitative data, measurement from a population, population of measurements, and improvement activities*)
- Statistical Methods (*Questions related to statistical inference, sample of measurements, population of measurements, and improvement activities*)
- Variables (*Questions related to quantitative variables, independent variables, and ratio variables*)

### **Example Questions**

An abstract of a research report states that cross tabulation was performed. This indicates to the reader that the analysis involved \_\_\_\_\_.

- A. two numerical variables
- B. two categorical variables
- C. one categorical and one numerical variable
- D. one numerical and one ordinal variable

**Correct Response: B**

Interviewing all the members of a given population is called \_\_\_\_\_.

- A. a sample
- B. a Gallup poll
- C. a census
- D. a Nielsen audit

**Correct Response: C**



## Assessment Service Validity and Reliability

### Introduction

The programmatic assessment services provided by Peregrine Academic Services (PAS) are used to assess retained knowledge of students at various academic degree levels. Schools deploy these services to evaluate the effectiveness of their academic programs, identify areas for improvement, and demonstrate program outcomes to external stakeholders.

PAS places a high priority on ensuring the validity and reliability of the assessment services. These practices begin at the design stage and continue through beta-testing, and with ongoing regularly scheduled quality reviews. The following outlines the approaches used to ensure ongoing validity and reliability.

**Validity** refers to the extent to which the test banks and the services measure the phenomena under consideration.

**Reliability** refers to the extent to which the exam results are repeatable and therefore data sets can be compared over time.

### Design Features that Impact Validity and Reliability

The following features apply to all assessment services.

- Exam scoring is 100% objective using automated marking.
- Each exam viewed by a student is unique using a random selection of questions from the test bank in random topic order.
- Timed response periods for questions. When the user navigates away from the exam screen, the screen fades, a message appears informing the user that he/she has left the exam window and the questions are timed.
- Students are unable to copy/paste from the exam window.
- The exam services meet the security requirements for Management of Information Technology (MIS) Sarbanes-Oxley (SOX) compliant organizations.
- Abandoned exams are excluded from summary reports.

## **Ensuring Ongoing Validity and Reliability**

### **Validity**

To ensure test bank validity, the following measures were adopted when the initial test banks were created. The same principles are used with subsequent changes to the test banks.

- The specific accreditation or certification requirements related to learning outcomes evaluation were used to determine the topics and subjects for the test banks.
- Current teachings for each topic were considered regarding the foundational level of each test bank.
- Exam questions were written and reviewed by academic professionals within each discipline. Similar subject matter experts are used with subsequent editing and for new questions.
- Each topic has questions designated for 4-8 subjects per topic to help ensure appropriate breadth of coverage and allow for specific learning outcomes measurement.
- Exam responses are either correct or incorrect with only one possible correct choice. Scores are determined by summarizing the percent correct: per subject, per topic, and by total score.

### **Reliability**

PAS contracted with external experts to design a comprehensive and statistically sound approach to measuring assessment service reliability. The result is that each year, a *Reliability Report* is generated for each assessment service. The report generates data for several reliability metrics and the data for each are compared with acceptability criteria to determine which test questions should be modified or replaced. Subject matter experts in the field are then contracted to modify/replace the targeted questions. Hence, the assessment service is regularly reviewed and improved to ensure ongoing reliability.

Reliability is determined by measuring *Item Difficulty*, *Item Discrimination* and *Question Interchangeability*.

**Item Difficulty** refers to percentage of students who answer questions correctly. Data are generated by topic and for each individual question. The target Item Difficulty is 60 percent correct with an acceptable range of 35 – 80 percent.

**Item Discrimination** refers to how well a question distinguishes between those students with more knowledge (higher overall exam scores) from those with less knowledge. Two measures are used: *Discrimination Index* and *Point-Biserial Correlation*.

For a given question, the Discrimination Index compares the scores of students with high overall test scores with students with low overall test scores. The scale is -1 to +1, with higher values indicating that a given question better distinguishes between high and low performing students. A value of  $\geq 0.20$  is considered acceptable.

Point-Biserial Correlation is equal to the Pearson's Correlation Coefficient between the scores on the entire exam and the scores on a specific question. A score of  $\geq 0.10$  is considered acceptable.

When assessing the quality of questions, both the Discrimination Index and the Point-Biserial Correlation Coefficient are reviewed.

**Question Interchangeability** refers to the ability to substitute a question in the test bank with another without significantly affecting the total score that an individual would receive on the exam. This is determined using Cohen's Effect Size  $d$  calculated based on a two-tailed  $t$ -test comparing the total score for all students who had that question in their exam versus the total score of the students who did not have that question in their exam. The scale is 0-1.0 and a score of  $< 0.20$  is considered acceptable.