

**FINAL COMPREHENSIVE EXAM**

FCE for three programs under Business Administration department will be done from 70 questions. Students will be provided with a pool of multiple-choice questions and the topics for the open questions. The exam will contain fields taken as compulsory courses during the education.



**PROGRAM OF BUSINESS INFORMATICS**

Profile	Number of questions in Exam	Number of question in Pool
Economics	6	30
Statistics & Econometrics	12	60
General Business	12	60
Accounting&Finance	6	30
Operations Management	12	60
Computer Engineering	22	110
<b>TOTAL</b>	<b>70</b>	<b>350</b>

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***Economics (Introduction to Economics I & Introduction to Economics II)***

1. The central problem *in economics* is that of:
  - a. comparing the success of command versus market economies
  - b. guaranteeing that production occurs in the most efficient manner
  - c. guaranteeing a minimum level of income for every citizen
  - d. allocating scarce resources in such a manner that society's unlimited needs or wants are satisfied as well as possible
  
2. In a free-market economy *the allocation of resources* is determined by
  - a. votes taken by consumers.
  - b. a central planning authority
  - c. By consumer preferences

- d. the level of profits of firms
3. What are the *three problems* of societies have to solve?
- What, how and where is produced?
  - What, how and for you is produced?
  - Why, what and how is produced?
  - What, how is produced and for whom it will be produced?
4. Which of the following shows the relationship between the price of a good and the amount of that good that consumers want at that price?
- supply curve
  - demand curve
  - supply schedule
  - production possibilities frontier
5. Which of the following is not a determinant of demand for good X?
- Average income.
  - input prices
  - Tastes and preferences.
  - Price of good X.
6. Which of the following factors will cause the supply curve to shift?
- Changes in technology.
  - Changes in input prices.
  - Changes in the prices of related goods.
  - All
7. Other things held equal, if demand increases, equilibrium price will \_\_\_\_\_ and equilibrium quantity will \_\_\_\_\_.

However, if supply increases, equilibrium price will \_\_\_\_\_ and equilibrium quantity will \_\_\_\_\_, other things held equal.

- a. decrease; decrease; increase; increase
- b. increase; increase; decrease; increase
- c. decrease; decrease; increase; decrease
- d. increase; increase; decrease; decrease

8. Which of the following situations leads to a lower equilibrium price?

- a. A decrease in demand accompanied by an increase in supply
- b. A decrease in supply accompanied by an increase in demand
- c. A decrease in supply, without a change in demand
- d. An increase in demand, without a change in supply

9. When the percentage change in quantity demanded is greater than the percentage change in price:

- a. There is little responsiveness in quantity demanded to changes in price.
  - a. There are few substitutes for the good in question.
  - b. The demand curve is relatively steep.
  - c. The value of demand elasticity is greater than one.
  - d. All of the above.

10. We get fewer and fewer additional units as we add more and more units of the inputs to production process. We call this fact the:

- a. law of diminishing marginal utility.
- b. law of diminishing returns.
- c. law of supply.
- d. law of demand.

11. \_\_\_\_\_ means that as inputs are added to the production process, output increases proportionally.

- a. constant returns to scale
- b. decreasing returns to scale
- c. economies of scale
- d. increasing returns to scale.

12. The cost of producing 5 units is \$567. The cost of producing 6 units is \$768. The marginal cost of producing the sixth unit is:

- a. \$128
- b. \$113
- c. \$201
- d. \$768

13. Which of the following formulas is correct?

- a.  $AVC = (TC-FC)/Q$
- b.  $AVC = FC/Q$
- c.  $AVC = TC/Q$
- d.  $AVC = (MC*Q-FC)/Q$

14. When marginal cost is above average cost, average cost is \_\_\_\_\_. Marginal cost will cross average cost at the point where: \_\_\_\_\_.

- a. decreasing; average cost is at its minimum
- b. increasing; average cost is at its maximum
- c. increasing; average cost is at its minimum
- d. decreasing; average cost is at its maximum

15. Using three units of labor, the firm can produce 1500 units of the good. Using four units of labor, the firm can produce 2400 units of the good. What is the average product of the fourth unit of labor?

- a. 400

- b. 450
  - c. 500
  - d. 600
16. Which of the following fits the definition of GDP?
- a. The value of all final goods and services produced within a given period.
  - b. The market value of a country's output.
  - c. The value of output produced by factors of production located within a country.
  - d. The market value of all final goods and services produced within a given period in a country.
17. An increase of 10% in nominal GDP indicates that:
- a. Both real GDP and the price level could have contributed to that increase.
  - b. The aggregate price level has increased by 10%.
  - c. Real output and the aggregate price level have increased by 5% each.
  - d. Real output has increased by 10%.
18. Which of the following is a measure of the overall price level?
- a. Nominal GDP.
  - b. The GDP deflator.
  - c. The inflation rate.
  - d. Real GDP.
19. In 2003, the consumer price index (CPI) was 184.0. In 2004, the CPI rose to 188.9. Using these CPI figures, what was the rate of inflation between these two years?
- a. 188.9%.
  - b. 2.66%.

- c. 2.59%.
  - d. 4.9%.
20. GDP=
- a.  $C+I+G$
  - b.  $C+G+X$
  - c.  $C+I+G+X$
  - d. none of the above
21. Perfect competition is found when:
- a. A large number of firms produce slightly differentiated products.
  - b. A single firm produces the entire output of an industry.
  - c. No firm is large enough to affect the market price.
  - d. An industry is dominated by few firms.
22. The zero-profit point will occur where:
- a.  $MC=P$
  - b.  $MC=MU$
  - c.  $AC=P$
  - d.  $AC=MP$
23. In monopolistic competition there is/are:
- a. Many sellers who each face a downward, sloping demand curve.
  - b. A few sellers who each face a downward, sloping demand curve.
  - c. Only one seller who faces a downward, sloping demand curve.
  - d. Many sellers who each face a perfectly elastic demand curve.

24. If a perfectly competitive firm cannot avoid economic losses, it should continue to operate in the short run as long as

- a. price exceeds average variable cost
- b. price exceeds average total cost
- c. the market price exceeds average total cost
- d. marginal revenue exceeds average fixed cost

25. Suppose, in 2010, you purchased a house built in 2003. Which of the following would be included in the gross domestic product for 2010?

- a. the value of the house in 2010
- b. the value of the house in 2003
- c. the value of the house in 2010 minus depreciation
- d. the value of the services of the real estate agent

26. Equilibrium output can be found arithmetically at the level where GDP equals \_\_\_\_\_.

- a. output
- b. planned consumption
- c. planned spending
- d. planned savings

27. If the economy would produce just two products: Tomatoes at a level of 2000 kg at price \$1.00 and Ketchup of 300 kg at \$4.00. Assume one half of the tomatoes are used in making the ketchup and the other half of the tomatoes are purchased by households. Nominal GDP is?

- a. 3400
- b. 2200
- c. 3000
- d. 3200

28. The Central Bank:

- a. Distributes coin and currency.
- b. Operates a nation-wide payments system.
- c. Supervises and regulates banks in its district.
- d. does all of the above

29.If nominal GDP was \$360 (billion) in 2012 and if the price level rose by 20 percent from 2010 to 2012, then the 2012 GDP, measured in 2010 prices, was (in billions):

- a. a.\$300
- b. b.\$320
- c. c.\$340
- d. d.\$360

30. What happens to export and import of that country, if domestic currency appreciates?

- a. export rises, import falls
- b. export falls, import rises
- c. both export and import rise
- d. both export and import fall

***Statistics (Statistics I, Statistics II)***

1. Quantitative data refers to data obtained with a(n)

- a) ordinal scale
- b) nominal scale
- c) either interval or ratio scale
- d) only interval scale

2. The scale of measurement that has an inherent zero value defined is the

- a) ratio scale
- b) nominal scale

- c) ordinal scale
- d) interval scale

3. A characteristic of interest for the elements is called a(n)

- a) sample
- b) data set
- c) variable
- d) None of these alternatives is correct.

4. Statistical studies in which researchers do not control variables of interest are

- a) experimental studies
- b) uncontrolled experimental studies
- c) not of any value
- d) observational studies

5. Statistical inference

- a) refers to the process of drawing inferences about the sample based on the characteristics of the population
- b) is the same as Data and Statistics
- c) is the process of drawing inferences about the population based on the information taken from the sample
- d) is the same as a census

The following information regarding the top eight Fortune 500 companies was presented in an issue of *Fortune Magazine*.

<b>Company</b>	<b>Sales \$ Millions</b>	<b>Sales Rank</b>	<b>Profits \$</b>	<b>Profits Rank</b>
General Motors	161,315	1	2,956	30
Ford Motor	144,416	2	22,071	2
Wal-Mart Stores	139,208	3	4,430	14
Exxon	100,697	4	6,370	5
General Electric	100,469	5	9,269	3
Int'l Business	81,667	6	6,328	6
Citigroup	76,431	7	5,807	8
Philip Morris	57,813	8	5,372	9
Boeing	56,154	9	1,120	82
AT&T	53,588	10	6,398	4

6. The measurement scale used for each variable (in order starting from left to right) is:

- a) nominal, ratio, ratio, ordinal, ordinal
- b) interval, order, ratio, ratio, nominal
- c) nominal, ratio, ordinal, ratio, ordinal
- d) nominal, interval, ordinal, ratio, ratio

7. In a cumulative frequency distribution, the last class will always have a cumulative frequency equal to:

- a) One
- b) 100%
- c) The total number of elements in the data set
- d) None of these alternatives is correct

**Exhibit 2-3:** Michael's Compute-All, a national computer retailer, has kept a record of the number of laptop computers they have sold for a period of 80 days. Their sales records are shown below:

Number of Laptops Sold	Number of Days
0 - 19	5
20 - 39	15
40 - 59	30
60 - 79	20
80 - 99	10
Total	80

8. Refer to Exhibit 2-3. The class width of the above distribution is:

- a) 0 to 100
- b) 20
- c) 80
- d) 5

9. Refer to Exhibit 2-3. If one develops a cumulative frequency distribution for the above data, the last class will have a frequency of:

- a) 10
- b) 100
- c) 0 to 100
- d) 80

10. Refer to Exhibit 2-3. The number of days in which the

company sold less than 60 laptops is:

- a) 20
- b) 30
- c) 50
- d) 60

11. Refer to Exhibit 2-3. The percentage of days in which the company sold at least 40 laptops is

- a) 37.5%
- b) 62.5%
- c) 90.0%
- d) 75.0%

12. Below you are given the examination scores of 20 students

99	92	86
72	76	95
58	65	79
	74	56

The relative frequency of students that scored between 80 and 89 is:

- a) 0.15
- b) 0.20
- c) 0.25
- d) 0.30

**Exhibit 2-4:** A sample of 15 children shows their favorite restaurant

McDonalds	Luppi's	Mellow Mushroom
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Friday's	McDonalds	McDonalds
Pizza Hut	Taco Bell	McDonalds
Mellow Mushroom	Luppi's	Pizza Hut
McDonalds	Friday's	McDonalds

13. Refer to Exhibit 2-4. The frequency distribution for these data is:

- a) McDonalds 4, Friday's 3, Pizza Hut 1, Mellow Mushroom 4, Luppi's 3, Taco Bell 1
- b) McDonalds 6, Friday's 2, Pizza Hut 2, MellowMushroom 2, Luppi's 2, TacoBell 1
- c) McDonalds 6, Friday's 1, Pizza Hut 3, Mellow Mushroom 1, Luppi's 2, Taco Bell 2
- d) McDonalds 2, Friday's 6, Pizza Hut 3, Mellow Mushroom 1, Luppi's 2, Taco Bell 2

14. When the smallest and largest percentage of items are removed from a data set and the mean is computed, the mean of the remaining data is

- a) the median
- b) the mode
- c) the trimmed mean
- d) any of the above

15. Which of the following is not a measure of dispersion?

- a) mode
- b) standard deviation
- c) range

- d) interquartile range
16. What type of error occurs if you fail to reject  $H_0$  when, in fact, it is not true?
- a. Type II
  - b. Type I
  - c. either Type I or Type II, depending on the level of significance
  - d. either Type I or Type II, depending on whether the test is one tail or two tail
17. The  $p$ -value is a probability that measures the support (or lack of support) for the
- a. null hypothesis
  - b. alternative hypothesis
  - c. either the null or the alternative hypothesis
  - d. sample statistic
18. For a lower bounds one-tailed test, the test statistic  $z$  is determined to be zero. The  $p$ -value for this test is
- a. zero
  - b. -0.5
  - c. +0.5
  - d. 1.00
19. For a two-tailed test at 86.12% confidence,  $Z =$
- a. 1.96
  - b. 1.48
  - c. 1.09
  - d. 0.86

20. A two-tailed test is performed at 95% confidence. The  $p$ -value is determined to be 0.09. The null hypothesis
- must be rejected
  - should not be rejected
  - could be rejected, depending on the sample size
  - has been designed incorrectly

21. The average manufacturing work week in metropolitan Chattanooga was 40.1 hours last year. It is believed that the recession has led to a reduction in the average work week. To test the validity of this belief, the hypotheses are

- $H_0: \mu < 40.1$   $H_a: \mu \geq 40.1$
- $H_0: \mu \geq 40.1$   $H_a: \mu < 40.1$
- $H_0: \mu > 40.1$   $H_a: \mu \leq 40.1$
- $H_0: \mu = 40.1$   $H_a: \mu \neq 40.1$

22. The academic planner of a university thinks that at least 35% of the entire student body attends summer school.

The correct set of hypotheses to test his belief is

- $H_0: P > 0.35$   $H_a: P \geq 0.35$
- $H_0: P \leq 0.35$   $H_a: P > 0.35$
- $H_0: P \geq 0.35$   $H_a: P < 0.35$
- $H_0: P > 0.35$   $H_a: P \leq 0.35$

**Exhibit 9-1**  $n = 36$   $\bar{x} = 24.6$   $S = 12$   $H_0: \mu \leq 20$   $H_a: \mu > 20$

23. Refer to exhibit 9.1 the test statistic is

- 2.3
- 0.38

- c. -2.3
- d. -0.38

24. Refer to exhibit 9.1 the p-value in between is

- a. 0.005 to 0.01
- b. 0.01 to 0.025
- c. 0.025 to 0.05
- d. 0.05 to 0.10

Exhibit 9-8

The average gasoline price of one of the major oil companies in Europe has been \$1.25 per liter. Recently, the company has undertaken several efficiency measures in order to reduce prices. Management is interested in determining whether their efficiency measures have actually **reduced** prices. A random sample of 49 of their gas stations is selected and the average price is determined to be \$1.20 per liter. Furthermore, assume that the standard deviation of the population ( $\sigma$ ) is \$0.14.

25. Refer to Exhibit 9-8. The standard error has a value of

- a. 0.14
- b. 7
- c. 2.5
- d. 0.02

26. Refer to Exhibit 9-8. The value of the test statistic for this hypothesis test is

- a. 1.96
- b. 1.645

- c. -2.5
- d. -1.645

27. Refer to Exhibit 9-8. The  $p$ -value for this problem is

- a. 0.4938
- b. 0.0062
- c. 0.0124
- d. 0.05

28. If we are interested in testing whether the mean of items in population 1 is larger than the mean of items in population 2, the

- a. null hypothesis should state  $\mu_1 - \mu_2 < 0$
- b. null hypothesis should state  $\mu_1 - \mu_2 > 0$
- c. alternative hypothesis should state  $\mu_1 - \mu_2 > 0$
- d. alternative hypothesis should state  $\mu_1 - \mu_2 < 0$

29. Independent simple random samples are taken to test the difference between the means of two populations whose variances are not known, but are assumed to be equal. The sample sizes are  $n_1 = 32$  and  $n_2 = 40$ . The correct distribution to use is the

- a. t distribution with 73 degrees of freedom
- b. t distribution with 72 degrees of freedom
- c. t distribution with 71 degrees of freedom
- d. t distribution with 70 degrees of freedom

30. In the analysis of variance procedure (ANOVA), "**factor**" refers to

- a. the dependent variable
- b. the independent variable

- c. the level of confidence
- d. the critical value of F

***General Business (Introduction to Business, Management and Organization)***

1. In 2016, Microsoft announced that it would buy LinkedIn for \$26.2 billion, in an all cash deal, making it the 6th largest deal if its kind on record. This is an example of:

- a. a hostile takeover
- b. an acquisition
- c. a partnership
- d. a licensing agreement

2. Partnerships have several advantages over sole proprietorships including:

- a. partners are provided with certain marketing materials and support including training.
- b. the partners are not liable for business debts.
- c. partnerships are significantly less likely to fail than sole proprietorships.
- d. the partners bring diverse skills and perspectives.

3. Which of the following is a legal entity completely separate from the entities who own it?

- a. sole proprietorship
- b. limited liability partnership

- c. corporation
- d. general partnership

4. A general partnership:

- a. assumes profit, liability and management duties are divided equally among partners.
- b. is similar to a corporation because the business has to pay corporate taxes.
- c. requires one partner to manage the business (a general manager) and other partners contribute skills and financing to support the business.
- d. a board of directors resolves disputes among the partners.

5. Which of these alternatives does not classify a company according to their function:

- a. Manufacturing companies
- b. Small and Medium Enterprises
- c. Service companies
- d. Marketing and Retail Companies

6. There are many ways that a business can reach the global market, the most intensive approach is through:

- a. Licensing Agreement.
- b. Franchise Agreement.
- c. exporting goods.
- d. Foreign Direct Investment.

7. In your country rubber trees are abundant and you can trade them very profitably for technology products,

which you cannot produce profitably in your country.

Your abundant rubber trees give you:

- a. absolute advantage.
- b. economies of scale.
- c. a stable economy.
- d. a comparative advantage

8. The point of a business cycle fluctuation during which growth slows, unemployment increases, and pricing pressures subside is called a(n):

- a. expansion.
- b. contraction
- c. peak.
- d. trough.

9. When more goods and services are imported than exported it is known as a:

- a. Trade surplus
- b. Balance of trade
- c. Trade Imbalance
- d. Trade deficit

10. What does Gross Domestic Product measure?

- a. Unemployment rate
- b. Budget surplus
- c. Value of goods and services produced by a country
- d. Budget deficit

11. You are employed by an automaker specializing in electric cars. As a production line supervisor your technical management skills will include:

- a. understanding self-awareness.
  - b. formulating strategies, objectives, and policies.
  - c. developing relationships with your team members.
  - d. understanding electricity storage in batteries.
12. What is one of the benefits of specialization in labor?
- a. Workers who specialize in certain tasks often learn to produce more quickly and with higher quality.
  - b. It allows workers to understand the overall process of producing a product or service.
  - c. Employees working on a variety of tasks will find that they are better at some than at others.
  - d. Specialization in labor leads to lower employment costs.
13. In a functional structure, communication generally occurs within each functional department and is transmitted across departments through:
- a. the CEO.
  - b. Chief Communication Officer.
  - c. team leads.
  - d. department heads.
14. An approach of open communication and collaborative decision making suggests which type of leadership?
- a. autocratic leadership
  - b. laissez-faire leadership
  - c. democratic leadership

d. delegative leadership

15. The first three steps in the controlling process include:

- a. comparing performance to standards; setting standards; taking corrective action.
- b. measuring performance; taking corrective action; revising performance standards.
- c. reviewing current processes, comparing processes to industry benchmarks, taking corrective action.
- d. setting standards; measuring performance; comparing performance to standards.

16. The organizing function of managers involves:

- a. not allocating resources needed to perform assigned activities.
- b. assigning activities identified in the planning process to some person, team or department.
- c. determining strategic priorities for the organization as a whole.
- d. determining how to most effectively utilize financial resources.

17. Humans need to feel a sense of belonging and acceptance, whether it comes from a large group or a small network of family and friends. Maslow labeled this as

- a. Social needs.
- b. Self-esteem needs
- c. Self-actualization.

- d. Safety needs.

18. When a need is met, Maslow argues that

- a. Self-esteem will become more important.
- b. Self-actualization will become more important.
- c. Social needs become more important.
- d. it will no longer serve a motivating function.

19. Involuntary termination is:

- a. resigning from your job—the employee quits the job.
- b. resigning from your job in order to start working a different job.
- c. being put on leave pending an internal or external investigation.
- d. losing your job—the employer fires the employee.

20. Today is Jerry's first day at his new job as a cashier at the local grocery store. When he arrives in the morning one of his new colleagues explains that Jerry will spend some time watching his colleague use the cash register while the colleague explains what he is doing. Then, after break time, it will be Jerry's turn to start acting as cashier, with his colleague right next to him to show him how to use the machine properly and conduct transactions with customers. Once he feels confident and learns this new skill, Jerry will be able to operate the cash register on his own. This is an example of:

- a. on-the-job training.

- b. off-the-job training.
  - c. professional development.
  - d. personal development.
21. \_\_\_\_\_ is the process of identifying suitable candidates and encouraging them to apply for job openings in the organization.
- a. Firing
  - b. Recruiting
  - c. Training
  - d. Hiring
22. The \_\_\_\_\_ is a system of organizations, people, activities, information, and resources involved in moving a product or service from supplier to customer.
- a. retail channel
  - b. wholesale channel
  - c. supply chain
  - d. distribution channel
23. An airplane manufacturer assembles a plane in one location and the workers and equipment go to the airplane when they need to work on it. This is an example of a \_\_\_\_\_.
- a. cellular layout
  - b. product layout
  - c. process layout
  - d. fixed-position layout

24. \_\_\_\_\_ is an inventory strategy that companies employ to increase efficiency and decrease waste by receiving goods only when they are needed in the production process.
- Just-in-time (JIT) inventory control
  - Material-requirements planning (MRP)
  - Product layout
  - Economic order quantity (EOQ)
25. Mass-produced products generally are:
- Prepaid, unique projects
  - Produced only after ordered
  - Semi-produced and completed upon order
  - Held in inventory until sold
26. During the \_\_\_\_\_ of the product life cycle, companies need to devote a significant marketing budget to create broad awareness and educate the public about the new product.
- introduction stage
  - growth stage
  - maturity stage
  - decline stage
27. \_\_\_\_\_ play an important role as intermediaries acting as a link in the distribution process to help move goods between producers and retailers.
- Agents
  - Retailers

- c. Direct distributors
- d. Wholesalers

28. When consumers purchase products from amazon.com or a bakery, it is an example of \_\_\_\_\_.

- a. agent channel
- b. direct channel
- c. retail channel
- d. indirect channel

29. Which of the following is not part of the marketing mix?

- a. Price
- b. Promotion
- c. Popularity
- d. Place

30. Accounting allows businesses to communicate information about a company's financial performance to the following groups of users:

- a. internal users, external users, and suppliers
- b. consumers, suppliers, and the government
- c. internal users, the government, and suppliers
- d. internal users, external users, and the government

31. Financial accountants:

- a. provide information to external entities that allows them to evaluate business performance.

- b. have a primary focus on providing managers within the organization with reports to make good business decisions.
- c. summarize the company's production activities in a way that allows managers to make decisions.
- d. work with government lobbyists to push for more favorable accounting regulations.

32. The \_\_\_\_\_ provides a snapshot of the company's financial position at a specific point in time.

- a. income statement
- b. statement of cash flows
- c. profit and loss statement
- d. balance sheet

33. Alia, the manager of a pet store, notices that most of the goods that come to her store are packed in high-quality cardboard boxes which are later discarded. She comes up with a plan and instructs her employees to use the cardboard boxes for making scratching boards for cats. She then sells the scratching boards at a price much lower than the other branded versions available in the market. Which of the following describes Alia's planning?

- a. Action oriented
- b. Priority oriented
- c. Advantage oriented
- d. Change oriented

34. Tim places an online order for a smartphone. Instead, he is shipped a dishwashing liquid from a brand named Bling by the

seller. Tim posts this incident on a social networking site and it is soon picked up by the media. Richard, the sales manager of Bling, hears about this incident and plans to use it as an opportunity for creating brand awareness of Bling products. Accordingly, he makes arrangement to send Tim the smartphone that he had originally ordered along with two more bottles of Bling dishwashing liquid. When this news reaches the media, people applaud Bling's gesture and Richard achieves his goal of creating brand awareness. Which of the following plans did Richard use in the scenario?

- a. Financial plan
  - b. Facilities plan
  - c. Tactical plan
  - d. Production plan
35. Sally, a manager at Purple Inc., has just been told that the funds which were left unused in the previous year's budget will not carry over into the current year. Thus, Sally will most likely have to use a \_\_\_\_\_.
- a. project budget
  - b. flexible budget
  - c. fixed budget
  - d. zero-based budget
36. At Home Décor Inc., the production manager demands zero defects on all raw materials received from its vendors. Which of the following concepts does this scenario illustrate?
- a. Output standard
  - b. Feedback control
  - c. Input standard
  - d. Historical standard

37. UPS carefully measures the routes and routines of its drivers to establish the time expected for each delivery. When a delivery manifest is scanned as completed, the driver's time is registered in an electronic performance log that is closely monitored by supervisors. In this scenario, UPS uses \_\_\_\_\_.
- historical comparisons
  - engineering comparisons
  - local comparisons
  - relative comparisons
38. Which of the following scenarios illustrates concurrent control?
- Susan, the customer care manager in an amusement park, actively seeks feedback from visiting tourists.
  - Jean, the manager in a restaurant, ensures that the vegetables used in cooking are organic.
  - Rebecca, the supervisor in a toy factory, gives suggestions to workers when they look for new designs.
  - Joshua, the stock manager in a steel factory, checks every evening whether adequate stocks are available for the next day's operations.
39. Your roommate wants to learn about organization charts. You can tell her that an organization chart can tell you all of the following about an organization **EXCEPT** its:
- division of work.
  - formal structure.
  - reporting relationships.
  - control mechanisms.

40. Community Bank Inc. currently operates with a functional structure. A lack of communication across functional departments has affected the performance of the employees. This scenario illustrates the concept of:
- matrix structure.
  - top-down structure.
  - functional chimneys.
  - cross-functional team.
41. Maria, the vice-president of operations at Choco Candy, Inc. (CCI), plans to create new divisions of CCI in China, India, and Malaysia. In this scenario, Maria develops a \_\_\_\_\_ for CCI.
- product structure
  - geographical structure
  - team structure
  - service structure
42. ABC Inc. uses information technology to connect with outside suppliers and service contractors. In this scenario, which of the following structures does ABC Inc. use?
- A cross-functional structure
  - A matrix structure
  - A network structure
  - A horizontal structure
43. ABC and XYZ, two organizations in the same industry, have come together to pursue areas of mutual interest. This scenario exemplifies a(n):
- unethical venture.
  - acquisition.
  - corporate takeover.
  - strategic alliance.

44. Netflix turned movie rental into a subscription business; eBay earns revenues by connecting users of its online marketplace; Google thrives on advertising revenues driven by ever-expanding Web technologies. These are all examples of \_\_\_\_\_.
- process innovations
  - virtual innovations
  - business model innovations
  - green innovations
45. Gene pursues creative and innovative ways to solve social problems. Hence, we can say that Gene participates in \_\_\_\_\_.
- social responsibility
  - social entrepreneurship
  - green innovation
  - commercializing innovation
46. If ABC, Inc. is focusing on a major and comprehensive redirection of the company, it is called a(n) \_\_\_\_\_ change.
- innovative
  - planned
  - transformational
  - incremental
47. Jake is a change leader who is responsible for bringing about a transformational change in his organization. He forces resisters to accept change by threatening them with a variety of undesirable consequences if they do not cooperate. Which of the following approaches is used by Jake to deal with the resistance to change?
- Education and communication
  - Participation and involvement
  - Manipulation and cooptation
  - Explicit and implicit coercion

48. Mary's manager has told her that if she can complete her project on time, she will get an extra bonus of \$10,000. Mary's manager is using \_\_\_\_\_.
- expert power
  - reward power
  - manipulative power
  - referent power
49. Jason, a manager, directs the efforts of others through tasks, rewards, and structures. He uses the \_\_\_\_\_ approach to leadership.
- transformational
  - participative
  - human relations
  - transactional
50. Your manager says that he will refuse your request for the weekend off to attend a concert unless you work the night shift for the rest of the week. In this case, he is using \_\_\_\_\_.
- legitimate power
  - reward power
  - expert power
  - coercive power
51. Susan, a manager at ABC International, focuses on authority and obedience, delegates little, and acts in a unilateral command-and-control fashion. Susan can be described as a(n) \_\_\_\_\_.
- democratic leader
  - human relations leader
  - laissez-faire leader
  - autocratic leader

52. When Mira offers pay raises, bonuses, special assignments, and compliments as incentives to her subordinates, she is utilizing which of these?
- Legitimate power
  - Expert power
  - Coercive power
  - Referent power
  - Reward power
53. According to the law of contingent reinforcement, to have maximum reinforcement value, a reward must be delivered only \_\_\_\_\_.
- by an employee's superior
  - if it is coupled with public recognition
  - if the employee receiving the reward is in the presence of other coworkers
  - if it has a monetary value
  - if the desired behavior is exhibited
54. One of the rules for giving constructive feedback is to make sure that it is always \_\_\_\_\_.
- general rather than specific
  - indirect rather than direct
  - given in small doses
  - delivered at a time convenient for the sender
55. When a worker receives an e-mail memo from the boss with information about changes to his job assignment and ends up confused because he doesn't understand it, the boss has erred by making a bad choice of \_\_\_\_\_ for communicating the message.

- a. words
- b. channels
- c. nonverbal
- d. filters

56. When dealing with proxemics as a silent language of culture, what is the issue of most concern?

- a. How people use the spoken word to communicate.
- b. How people use nonverbal to communicate.
- c. How people use time to communicate.
- d. How people use space to communicate.

57. Pluralism and the absence of discrimination and prejudice in policies and practices are two important hallmarks of \_\_\_\_\_.

- a. the glass ceiling effect
- b. a multicultural organization
- c. quality circles
- d. affirmative action

**58. (Open Question) Improving Team Decisions**

**59. (Open Question) Diversity**

**60. (Open Question) Job Design, Job Enrichment**

***Accounting and Finance (Introduction to Accounting, Fundamentals of Corporate Finance)***

1. Which of the following statements about users of accounting information is incorrect?

- (a) Management is an internal user.
  - (b) Taxing authorities are external users.
  - (c) Present creditors are external users.
  - (d) Regulatory authorities are internal users.
2. Liabilities of a company would **not** include
- accounts receivable.
  - accounts payable
  - notes payable
  - salaries and wages payable
3. All of the financial statements are for a period of time **except** the
- (a) income statement.
  - (b) statement of financial position.
  - (c) statement of cash flows.
  - (d) retained earnings statement.
4. The financial statement that reports assets, liabilities, and equity is the:
- (a) income statement.
  - (b) retained earnings statement.
  - (c) statement of financial position.
  - (d) statement of cash flows.
5. As of December 31, 2014, Stoneland Company has assets of €3,500 and equity of €2,000. What are the liabilities for Stoneland Company as of December 31, 2014?
- (a) €1,500.
  - (b) €1,000.
  - (c) €2,500.
  - (d) €2,000.

6. Credits

- increase both assets and liabilities.
- decrease both assets and share capital.
- increase liabilities and decrease assets.
- decrease both assets and liabilities.

7. Accounts that normally have debit balances are:

- (a) assets, expenses, and revenues.
- (b) assets, expenses, and share capital—ordinary.
- (c) assets, liabilities, and dividends.
- (d) assets, dividends, and expenses.

8. Which of the following statements about a journal is false?

- (a) It is not a book of original entry.
- (b) It provides a chronological record of transactions.
- (c) It helps to locate errors because the debit and credit amounts for each entry can be readily compared.
- (d) It discloses in one place the complete effect of a transaction.

9. A ledger:

- (a) contains only asset and liability accounts.
- (b) should show accounts in alphabetical order.
- (c) is a collection of the entire group of accounts maintained by a company.
- (d) is a book of original entry.

10. The purchase of supplies on account should result in:

- (a) a debit to Supplies Expense and a credit to Cash.
- (b) a debit to Supplies Expense and a credit to Supplies.
- (c) a debit to Supplies and a credit to Accounts Payable.

(d) a debit to Supplies and a credit to Accounts Receivable.

11. Posting:

- (a) normally occurs before journalizing.
- (b) transfers ledger transaction data to the journal.
- (c) is an optional step in the recording process.
- (d) transfers journal entries to ledger accounts.

12. Before posting a payment of €5,000, the Accounts Payable of Senator Company had a normal balance of €16,000. The balance after posting this transaction was:

- (a) €21,000.
- (b) €5,000.
- (c) €11,000.
- (d) Cannot be determined.

13. The trial balance of Clooney Corporation had accounts with the following normal balances: Cash \$5,000, Service Revenue \$85,000, Salaries and Wages Payable \$4,000, Salaries and Wages Expense \$40,000, Rent Expense \$10,000, Share Capital— Ordinary \$42,000, Dividends \$15,000, and Equipment \$61,000. In preparing a trial balance, the total in the debit column is:

- (a) \$131,000.
- (b) \$216,000.
- (c) \$91,000.
- (d) \$116,000.

14. The revenue recognition principle states that:

- (a) revenue should be recognized in the accounting period in which a performance obligation is satisfied.

- (b) expenses should be matched with revenues.
  - (c) the economic life of a business can be divided into artificial time periods.
  - (d) the fiscal year should correspond with the calendar year.
15. Adjusting entries are made to ensure that:
- (a) expenses are recognized in the period in which they are incurred.
  - (b) revenues are recorded in the period in which services are provided.
  - (c) statement of financial position and income statement accounts have correct balances at the end of an accounting period.
  - (d) All the responses above are correct.
16. For a bond selling at face value, the following is always true:
- a.  $YTM > Cr$
  - b.  $YTM = Cr$
  - c.  $YTM < Cr$
  - d. None of them
17. The receivables turnover is 10 times; accounts receivable is \$24,000; costs are \$80,000, and Earnings before Taxes (EBT) is -\$20,000. The Operating Cash Flow for this company are:
- a. \$140,000
  - b. \$160,000
  - c. \$180,000

d. \$200,000

18. If Current Ratio is 1.5 and Net Working Capital is \$5,000;  
then Current Assets are:

- a. \$5,000
- b. \$10,000
- c. \$15,000
- d. \$20,000

19. If Total Debt Ratio is 0.6; then the Equity Multiplier is:

- a. 1.5
- b. 2.5
- c. 3.5
- d. 4.5

20. What is your tax bill if you have a wage of 250,000 leke:

<b>Taxable Income (leke)</b>	<b>Tax Rate</b>
0-30,000	0%
30,000-130,000	13%
Above 130,000	23%

- a. 13,000
- b. 27,600
- c. 40,600
- d. 50,600

21. You deposit \$5,000 in Raiffeisen Bank. The bank pays you  
8% simple interest. How much will you have after 15 years:

- a. \$3,000
- b. \$6,000

- c. \$9,000  
d. \$11,000
22. You want to get a loan worth \$200,000. In order to get this loan, the bank requires you to have 20% of the loan's value in deposits. If, you currently have only 35,000\$ in an account that pays 10% interest, in how many years you can get the loan?
- a. 0.4 years  
b. 1.4 years  
c. 2.4 years  
d. 3.4 years
23. You deposit \$2,000 in BKT. If your account pays 6% for the first year, 7% for the next year, and 8% for all consecutive years, how much will you have after 10 years?
- a. \$2,198.65  
b. \$3,198.65  
c. \$4,198.65  
d. \$8,587.05
24. You will receive \$1,000 in four years, \$2,000 in five years and \$3,000 in six years. With an interest rate of 10%, what is the present value of these cashflows (their value at year 0)?
- a. \$3,618.28  
b. \$4,618.28  
c. \$6,000  
d. \$6,618.28
25. Which of the following is the best investment option as a depositor:

- a. 12 % compounded monthly
  - b. 12.3% compounded quarterly
  - c. 12.5 % compounded annually
26. The present value of a perpetuity making monthly payments of \$500 with an interest rate of 6% compounded monthly is:
- a. \$8,333
  - b. \$10,000
  - c. \$83,333
  - d. \$100,000
27. The current price of a zero-coupon bond with a YTM of 7% and 10 years to maturity is:
- a. \$499
  - b. \$508
  - c. \$614
  - d. \$1082

**28. (Open Question) Defining Accounting Equation Accounts**

**29. Open Question) Journalising Transactions.**

**30 . (Open Question) Preparing Financial Statements.**

***Operations Management (Operations Management, Operations Research)***

1) Operations Management is responsible for increasing the organization's efficiency, which means the company will be able to \_\_\_\_\_.

- a. add to the engineering process
- b. take for granted current operations
- c. increase the number of positions under the manager's position
- d. eliminate activities that do not add value

2) The total of all outputs produced by the transformation process divided by the total of the inputs is:

- a. utilization.
- b. greater in manufacturing than in services.
- c. defined only for manufacturing firms.
- d. multifactor productivity.

3) Which is NOT true regarding differences between goods and services?

- a. Services are generally produced and consumed simultaneously; tangible goods are not.
- b. Services tend to be more knowledge-based than goods.
- c. Services tend to have a more inconsistent product definition than goods.
- d. Goods tend to have higher customer interaction than services.

4) Maria's House of Pancakes uses four months moving

average method to forecast pancake sales. If sales amounted to 1500 pancakes in April, 1000 pancakes in May, 2200 pancakes in June, and 3000 pancakes in July, what should be the forecast for August?

- a. 2400
- b. 2511
- c. 2067
- d. 1925

5) Given forecast errors of -1, 5, 8, 1 and -3, what is the mean absolute deviation?

- a. 20
- b. 3.6
- c. 4
- d. 8

6) Which of the following nets the largest productivity improvement?

- a. increase output 15%
- b. decrease input 15%
- c. increase both output and input by 5%
- d. increase output 10%, decrease input 3%

7) Productivity can be improved by:

- a. increasing inputs while holding outputs steady.
- b. decreasing outputs while holding inputs steady.
- c. increasing inputs and outputs in the same proportion.
- d. decreasing inputs while holding outputs steady.

8) Which of the following are among the 10 strategic operations management decisions?

- I. design of goods and services
- II. managing quality
- III. layout strategy
- IV. marketing
- V. pricing of goods and services

- a. I, II, V
- b. I, II, IV
- c. II, III, V
- d. I, II, III

9) Operations management is applicable:

- a. mostly to the service sector.
- b. to services exclusively.
- c. mostly to the manufacturing sector.
- d. to all firms, whether manufacturing or service.

10) Which of the following are the primary functions of all organizations?

- a. production/operations, marketing, and human resources
- b. marketing, human resources, and finance/accounting
- c. sales, quality control, and production/operations
- d. marketing, production/operations, and finance/accounting

11) Which one of the following products is most likely made in a job shop environment?

- a. rolls of newsprint
- b. customized furniture
- c. television sets
- d. cigarettes

12) A work system has five stations that have process times of 5, 9, 4, 9, and 8. What is the throughput time of the system?

- a. 4
- b. 9
- c. 18
- d. 35

13) An employee produces 15 parts during a shift in which he made \$60. What is the labor cost per unit of the product?

- a. \$90
- b. \$5
- c. \$6
- d. \$4

14) A product-oriented layout would be MOST appropriate for which one of the following businesses?

- a. fast food
- b. steel making

- c. insurance sales
- d. clothing alterations

15) Process A has fixed costs of \$1000 and variable costs of \$5 per unit. Process B has fixed costs of \$500 and variable costs of \$15 per unit. What is the crossover point between process A and process B?

- a. 50 units
- b. 200 units
- c. \$2,500
- d. \$5,000

16) Which of the following companies uses a mass customization approach?

- a. Dell
- b. Harley Davidson
- c. Frito-Lay
- d. Arnold Palmer hospital

17) Break-even is the number of units at which:

- a. total revenue equals price times quantity.
- b. total revenue equals total cost.
- c. total revenue equals total fixed cost.
- d. total profit equals total cost.

18) A full-service restaurant is considering opening a new facility in one of two new cities. The table below shows its ratings of four factors at each of two potential sites.

Factor	Weight	Gary Mall	Belt Line
Affluence of local population	.20	30	30
Traffic flow	.40	50	20
Parking availability	.20	30	40
Growth potential	.20	10	30

The score for Gary Mall is \_\_\_\_\_

- a. 120
- b. 22
- c. 18
- d. 34

19) A fleet repair facility has the capacity to repair 800 trucks per month. However, due to scheduled maintenance of their equipment, management feels that they can repair no more than 600 trucks per month. Last month, two of the employees were absent several days each, and only 400 trucks were repaired.

What is the utilization of the repair shop?

- a. 86.4%
- b. 95%
- c. 80%
- d. 50%

20) A product-focused process is commonly used to

produce:

- a. high-volume, high-variety products.
- b. low-volume, high-variety products.
- c. high-volume, low-variety products.
- d. high-volume products of either high- or low-variety.

21) Frito-Lay is to \_\_\_\_\_ focus as Harley Davidson is to \_\_\_\_\_ focus.

- a. process; repetitive
- b. product; repetitive
- c. repetitive; product
- d. process; product

22) Which of the statements below best describes office layout?

- a. positions workers, their equipment, and spaces/offices to provide for movement of information
- b. addresses the layout requirements of large, bulky projects such as ships and buildings
- c. seeks the best personnel and machine utilization in repetitive or continuous production
- d. allocates shelf space and responds to customer behavior

23) Which of the following statements regarding fixed costs is TRUE?

- a. Fixed costs rise by a constant amount for every added unit of volume.

- b. While fixed costs are ordinarily constant with respect to volume, they can "step" upward if volume increases result in additional fixed costs.
- c. Fixed costs are those costs associated with direct labor and materials.
- d. Fixed costs equal variable costs at the break-even point.

24) A product has a demand of 4000 units per year. Ordering cost is \$20, and holding cost is \$4 per unit per year. Find the cost-minimizing solution for this product is to order.

- a.200
- b.190
- c.210
- d. 400

25) For a given product demand, the time-series trend equation is  $53 + 4x$ . The positive sign on the slope of the equation:

- a. is an indication that product demand is increasing
- b. is an indication that the forecast is biased, with forecast values lower than actual values.
- c. is an indication that product demand is declining.
- d. implies that the coefficient of determination will also be negative.

26) Standardization is an appropriate strategy in which stage of the product life cycle?

- a. introduction
- b. growth
- c. maturity
- d. decline

27) Process X has fixed costs of \$10,000 and variable costs of \$2.40 per unit. Process Y has fixed costs of \$9,000 and variable costs of \$2.25 per unit. Which of the following statements is TRUE?

- a. The crossover point is approximately 6667 units.
- b. It is impossible for one process to have both of its costs lower than those of another process.
- c. Process Y is cheaper than process X at all volumes.
- d. Process X should be selected for very large production volumes.

28. Linear programming involves the planning of activities to obtain an optimal result.

- a. True
- b. False

29. Any problem whose mathematical model fits the very general format for the linear programming model is a linear programming problem.

- a. True
- b. False

30. A slack variable is added to the constraint functions to convert them from greater or equal to less or equal than right-side values.

- a. True
  - b. False
31. The tableau method applies straight away to the minimization LP problems.
- a. True
  - b. False
32. In the simplex tableau method, the pivot column determines the variable IN, while the pivot row determined the variable OUT.
- a. True
  - b. False
33. Other alternative names of Operations Research include:
- a. Management science
  - b. Decision analysis
  - c. Decision science
  - d. All the above
34. What is an optimal solution to a certain problem?
- a. A solution to the model that maximizes or minimizes some measure of merit over all feasible solutions.
  - b. A solution to the model that only maximizes some measure of merit over all feasible solutions.
  - c. A solution to the model that only minimizes some measure of merit over all feasible solutions.
  - d. None of the above
35. Which of the following is not a phase of the OR Problem Solving Process?
- a. Formulating the model

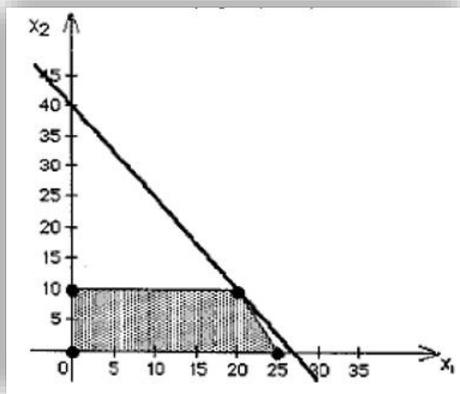
- b. Testing the model
  - c. Weekly scheduling
  - d. None of the above
36. The following should be taken in consideration when constructing a model?
- a. Problem must be translated from qualitative to quantitative terms
  - b. Form a logical model with a series of rules
  - c. Define relationships between various factors of the problem.
  - d. All the above
37. A solution for which all constraints are satisfied is called:
- a. Infeasible solution
  - b. Feasible solution
  - c. Optimal solution
  - d. None of the above
38. A feasible solution that has the most favorable value of the objective function is called:
- a. Infeasible solution
  - b. Feasible solution
  - c. Optimal solution
  - d. None of the above
39. When defining a problem in OR, all the following should be considered, EXCEPT:
- a. Short run over long-run profit maximization
  - b. Long run over short-run profit maximization
  - c. Ensuring the appropriate objectives
  - d. Social responsibility to stakeholders

**Questions 20 – 23** apply to the following linear programming problem:

$$\begin{array}{l} \text{Maximize} \quad Z = 10x_1 + 20x_2, \\ \text{subject to} \\ \quad -x_1 + 2x_2 \leq 15 \\ \quad x_1 + x_2 \leq 12 \\ \quad 5x_1 + 3x_2 \leq 45 \\ \text{and} \\ \quad x_1 \geq 0, \quad x_2 \geq 0. \end{array}$$

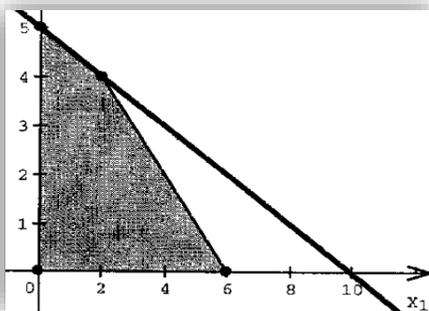
40.  $X_1$  and  $X_2$  variables in the above model represent:
- Constraints
  - Decision variables
  - Objective function
  - Profit variables
41. Equation  $Z = 10X_1 + 20X_2$  in the above model represents:
- Constraints
  - Decision variables
  - Objective function
  - Profit variables
42. Equation  $5X_1 + 3X_2 \leq 45$  in the above model represents:
- Constraint
  - Decision variables
  - Objective function
  - Profit variables

43. What is the optimal solution in the following graphical solution of an LP problem?



- a. (0,0)
- b. (0,10)
- c. (10,20)
- d. (25,0)

44. What is the optimal solution in the following graphical solution of an LP problem?



- a. (0,0)

- b. (0,5)
- c. (2,4)
- d. All points in the line between from (0,5) until (2,4)

45. What is the next step in solving the following problem by Simplex Tableau Method, after adding the slack variables?

$$\begin{aligned} \text{Max } Z &= 10X_1 + 5X_2 \\ \text{s.t.} \quad & 2X_1 \leq 10 \\ & X_2 \leq 8 \\ & 3X_1 + 2X_2 \leq 18 \\ & X_1 \geq 0, X_2 \geq 0 \end{aligned}$$

a. Solution a

basic var	Z	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	Right Side
Z	1	-10	-5	0	0	0	0
$x_3$	0	2	0	1	0	0	10
$x_4$	0	0	1	0	1	0	8
$x_5$	0	3	2	0	0	1	18

Handwritten notes on the tableau:  
 - "Pivot column" with an arrow pointing to the  $x_1$  column.  
 - "Pivot row" with an arrow pointing to the  $x_3$  row.  
 - "Coefficients" written above the constraint columns.  
 - "Z - 10x" written above the objective function row.  
 - A red checkmark is placed under the pivot element (2) in the  $x_3$  row,  $x_1$  column.

b. Solution b

Basic Var	coefficients						Right Side
	$z$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	
$z$	1	0	-5	5	0	0	50
$x_1$	0	1	0	$\frac{1}{2}$	0	0	5
$x_4$	0	0	1	0	1	0	$8\left(\frac{4}{2}\right)$
$x_5$	0	0	2	$-\frac{3}{2}$	0	1	$3\left(\frac{3}{2}\right)$

46. What is the dual form of the following LP problem?

Maximize  $z = 2x_1 + x_2$ ,  
 subject to:

$$x_1 + x_2 \leq 4,$$

$$x_1 - x_2 \leq 2,$$

$$x_1 \geq 0, \quad x_2 \geq 0.$$

a. Formulation a

Minimize  $v = 4y_1 + 2y_2$ ,  
 subject to:

$$y_1 + y_2 \geq 4$$

$$y_1 - y_2 \geq 2$$

$$y_1 \geq 0, \quad y_2 \geq 0.$$

b. Formulation b

$$\begin{aligned} &\text{Minimize } v = 4y_1 + 2y_2, \\ &\text{subject to:} \\ &\quad y_1 + y_2 \geq 2, \\ &\quad y_1 - y_2 \geq 1, \\ &\quad y_1 \geq 0, \quad y_2 \geq 0. \end{aligned}$$

47. Given the following data, what is the correct formulation of the linear programming model for this problem?

Resource	Resource Usage per Unit of Activity		Amount of Resource Available
	wood-framed	aluminum-framed	
glass	6	8	48
aluminum	0	1	4
wood	1	0	6
Unit Profit	\$60	\$30	--

a. Formulation a

$$\begin{aligned} &\text{Max } Z = 60 X_1 + 30 X_2 \\ &\text{s.t.} \\ &\quad 6X_1 + 8 X_2 \leq 48 \\ &\quad X_2 \leq 4 \\ &\quad X_1 \leq 6 \\ &\quad X_1 \geq 0, X_2 \geq 0 \end{aligned}$$

b. Formulation b

$$\begin{aligned} \text{Max } Z &= 48 X_1 + 4 X_2 + 6 X_3 \\ \text{s.t.} \\ 6X_1 + 8 X_2 &\leq 48 \\ X_2 &\leq 4 \\ X_1 &\leq 6 \\ X_1 \geq 0, X_2 &\geq 0 \end{aligned}$$

**Questions** apply to the following transportation problem:

From \ To	A	B	C	Supply (availability)
1	4	3	8	300
2	7	5	9	300
3	4	5	5	100
Demand (requirement)	200	200	300	700 ← Total demand and supply

48. Which table represents the optimal solution through North West Corner approach?
- a. Table a

From \ To	A	B	C	Supply
1	200	100		300
2		100	200	300
3			100	100
Demand	200	200	300	

b. Table b

From \ To	A	B	C	Supply
1	100	200		300
2	100		200	300
3			100	100
Demand	200	200	300	

49. What is the total cost of the optimal solution found in **Question 51**?

- a. 3900
- b. 4700
- c. 3500
- d. 4500

50. Which table represents a better solution through Least Cost Method?

- a. Table a

From \ To	A	B	C	Supply (availability)
1	100	200		300
2			300	300
3	100			100
Demand (requirement)	200	200	300	700

b. Table b

From \ To	A	B	C	Supply (availability)
1			300	300
2	200	100		300
3		100		100
Demand (requirement)	200	200	300	700

51. What is the total cost of the optimal solution found in Question 53?

- a. 3900
- b. 4100
- c. 4800
- d. 4900

52. Which transportation assignment method offers a better transportation solution?
- North West Corner approach
  - Least Cost Method

**Questions** apply to the following project management problem:

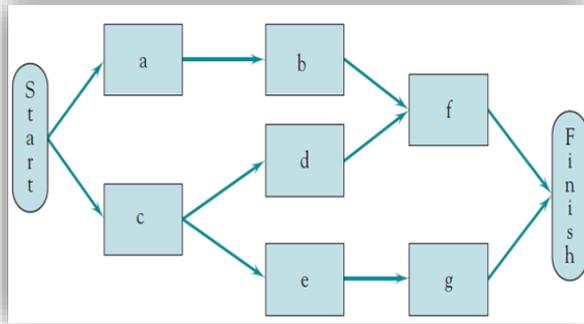
<b>Table: A sample set of Project Activities</b>		
<b>Task/Activity</b>	<b>Predecessor(s)</b>	<b>Duration (days)</b>
<b>A</b>	-	2
<b>B</b>	-	3
<b>C</b>	A	2
<b>D</b>	B	5
<b>E</b>	B	6
<b>F</b>	C, D	5
<b>G</b>	E	2

Given the above listed activities, how do you find the following statements?

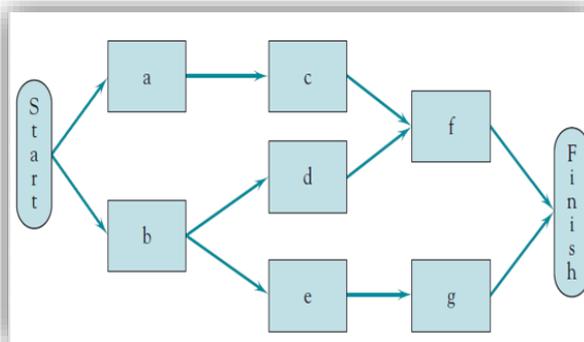
53. Activities A and B are independent; therefore, they can start simultaneously.
- True
  - False
54. Activity F may start without finishing Activities C and D.
- True
  - False

55. What is the correct AON network of the above sampled project?

a. Figure a



b. Figure b



56. (Open Questions) Linear Programming

57. (Open Questions) Linear Programming

58. ( Open Question) 10 strategic decisions that operations managers take

59. (Open Question) Productivity Measurement;

60. (Open Question) Quality Management.

**Computer Engineering (Introduction to Algorithms and Programming, Object Oriented Programming, Web Technologies, Web Programming)**

- i. What is the printout of the second println statement in the main method?

```
public class Foo {
    int i;
    static int s;

    public static void main(String[] args) {
        Foo f1 = new Foo();
        System.out.println("f1.i is " + f1.i + " f1.s is " + f1.s);
        Foo f2 = new Foo();
        System.out.println("f2.i is " + f2.i + " f2.s is " + f2.s);
        Foo f3 = new Foo();
        System.out.println("f3.i is " + f3.i + " f3.s is " + f3.s);
    }

    public Foo() {
        i++;
        s++;
    }
}
```

- a. f2.i is 2 f2.s is 1  
b. f2.i is 2 f2.s is 2  
c. f2.i is 1 f2.s is 2  
d. f2.i is 1 f2.s is 1
- ii. To prevent a class from being instantiated, \_\_\_\_\_  
i. don't use any modifiers on the constructor.

- ii. use the static modifier on the constructor.
  - iii. use the private modifier on the constructor.
  - iv. use the public modifier on the constructor
- iii. What is displayed by the following code?

```
public static void main(String[ ] args) throws Exception {  
    String[ ] tokens = "Welcome to Java".split("o");  
    for (int i = 0; i < tokens.length; i++) {  
        System.out.print(tokens[i] + " ");  
    }  
}
```

- a. Welc me to Java
  - b. Welc me t Java
  - c. Welcome t Java
  - d. Welcome to Java
- iv. The JDK command to compile a class in the file Test.java is
- a. java Test
  - b. java Test.java
  - c. JAVAC Test.java
  - d. javac Test
  - e. javac Test.java
- v. Which of the following are correct ways to declare variables? (Choose all that apply.)
- a. int length, width;
  - b. int length; int width;
  - c. int length; width;
  - d. int length, int width;

vi. What is y displayed in the following code?

```
public class Test {  
    public static void main(String[] args) {  
        int x = 1;  
        int y = x++ + x;  
        System.out.println("y is " +  
            y);  
    }  
}
```

- a. y is 4.
- b. y is 3.
- c. y is 2.
- d. y is 1

vii. Suppose income is 4001, what is the output of the following code:

```
if (income > 3000) {  
    System.out.println("Income is greater than 3000");  
}  
else if (income > 4000) {  
    System.out.println("Income is greater than 4000");  
}
```

- a. Income is greater than 3000
- b. no output
- c. Income is greater than 4000 followed by Income is greater than 3000
- d. Income is greater than 4000
- e. Income is greater than 3000 followed by Income is greater

than 4000

**viii.** Analyze the following statement:

```
double sum = 0;

for (double d = 0; d < 10;)
{
    d += 0.1;
    sum += sum + d;
}
```

- a. The program compiles and runs fine.
- b. The program has a compile error because the control variable in the for loop cannot be of the double type.
- c. The program has a compile error because the adjustment is missing in the for loop.
- d. The program runs in an infinite loop because  $d < 10$  would always be true

9.  $(\text{int})(\text{Math.random()} * (65535 + 1))$  returns a random number \_\_\_\_\_.

- a. between 1 and 65535
- b. between 0 and 65536
- c. between 0 and 65535
- d. between 1 and 65536

**10.** Analyze the following code

```
class Test {  
    public static void main(String[]  
        args) { String s;  
        System.out.println("s is " + s);  
    }  
}
```

- The program has a runtime error because `s` is not initialized, but it is referenced in the `println` statement.
- The program has a compilation error because `s` is not initialized, but it is referenced in the `println` statement.
- The program compiles and runs fine.
- The program has a runtime error because `s` is null in the `println` statement.

11. What is `y` displayed?

```
public class Test {  
    public static void main(String[] args) {  
        int x = 1;  
        int y = x + x++;  
        System.out.println("y is "  
            + y);  
    }  
}
```

- `y` is 3.
- `y` is 2.
- `y` is 4.
- `y` is 1

12. Analyze the following code.

```
public class Test {  
    public static void main(String[]  
    args) { int n = 2;  
        xMethod(n);  
  
        System.out.println("n is " + n);  
    }  
  
    void  
    xMethod(int n) {  
        n++;  
    }  
}
```

- a) The code has a compile error because xMethod is not declared static.
- b) The code prints n is 3.
- c) The code prints n is 1.
- d) The code prints n is 2.
- e) The code has a compile error because xMethod does not return a value.

13. The expression "Java " + 1 + 2 + 3 evaluates to

\_\_\_\_\_.

- a. Java123
- b. java 123
- c. Java6
- d. Java 123
- e. Illegal expression

14. Which of the following is the correct expression that evaluates to true if the number  $x$  is between 1 and 100 or the number is negative?

- a.  $((x < 100) \&\& (x > 1)) \&\& (x < 0)$
- b.  $1 < x < 100 \&\& x < 0$
- c.  $(1 > x > 100) \parallel (x < 0)$
- d.  $((x < 100) \&\& (x > 1)) \parallel (x < 0)$

15. What is the correct HTML for inserting an image?

- a. `<img href="image.gif" alt="MyImage">`
- b. `<image src="image.gif" alt="MyImage">`
- c. `<img alt="MyImage">image.gif</img>`
- d. ``

16. What is the difference between XML and HTML?

- a. HTML is used for exchanging data, XML is not.
- b. XML is used for exchanging data, HTML is not.
- c. HTML can have user defined tags, XML cannot
- d. Both B and C above

17. Each list item in an ordered or unordered list has which tag?

- a. list tag
- b. ls tag
- c. li tag
- d. ol tag

18. What are `<div>` tags used for?

- a. To replace paragraphs. i.e. p tags
- b. To logically divide the paragraphs

- c. To logically divide the document
- d. To provide space between tables

**19.**What are meta tags used for?

- a. To store information usually relevant to browsers and search engines.
- b. To only store information usually relevant to browsers
- c. To only store information about search engines.
- d. To store information about external links

**20.**What does the following code do: “<u><a name=’text’></a>text</b></u>”?

- a. Only underlines "text"
- b. Create an anchor and underline "text"
- c. Create an anchor and italicize "text"
- d. Create a link and underline "text"

**21.**What is the correct HTML for referring to an external style sheet?

- a. <link rel="stylesheet" type="text/css" href="mystyle.css">
- b. <stylesheet>mystyle.css</stylesheet>
- c. <style src="mystyle.css">
- d. None of above
- e. All of above

**22.**Which is the correct CSS syntax?

- a. {body;color=black;}
- b. body {color: black;}
- c. body;color=black;
- d. {body;color:black;}

**23.** What is the correct CSS syntax for making all the <p> elements bold?

- a. `p {font-weight:bold;}`
- b. `p {text-size:bold;}`
- c. `<p style="font-size:bold;">`
- d. `<p style="text-size:bold;">`

**24.** How do you display hyperlinks without an underline?

- a. `a {text-decoration:none;}`
- b. `a {decoration:no-underline;}`
- c. `a {underline:none;}`
- d. `a {text-decoration:no-underline;}`

**25.** How do you display a border like this:

The top border = 10 pixels

The bottom border = 5 pixels

The left border = 20 pixels

The right border = 1pixel?

- a. `border-width:10px 5px 20px 1px;`
- b. `border-width:10px 1px 5px 20px;`
- c. `border-width:10px 20px 5px 1px;`
- d. `border-width:5px 20px 10px 1px;`

**26.** How do you select an element with id "demo"?

- a. `*demo`
- b. `demo`
- c. `#demo`
- d. `.demo`

**27.**How do you select all p elements inside a div element?

- a. `div p`
- b. `div + p`
- c. `div.p`
- d. `div#p`

**28.**Which of the following property is used to underline, overline, and strikethrough text?

- a. `text-indent`
- b. `text-align`
- c. `text-decoration`
- d. `text-transform`

**29.**Which of the following property allows you to control the shape or appearance of the marker of a list?

- a. `list-style-type`
- b. `list-style-position`
- c. `list-style-image`
- d. `list-style`

**30.**Which of the following is correct about CSS?

- a. Style sheets allow content to be optimized for more than one type of device.
- b. CSS can store web applications locally with the help of an offline cache.
- c. Using CSS, we can view offline websites. The cache also ensures faster loading and better overall performance of the website.
- d. All of the above.

**31.**What is the correct JavaScript syntax to change the content of the HTML element below?

`<p id="demo">This is a demonstration.</p>`

- a. `document.getElementById("demo").innerHTML = "Hello World!";`
- b. `document.getElementsByName("p").innerHTML = "Hello World!";`
- c. `document.getElement("p").innerHTML = "Hello World!";`
- d. `#demo.innerHTML = "Hello World!";`

**32.**Which event occurs when the user clicks on an HTML element?

- a. `onmouseclick`
- b. `onclick`
- c. `onmouseover`
- d. `onchange`

**33.**What does DTD stand for?

- a. Dynamic Type Definition
- b. Direct Type Definition
- c. Document Type Definition
- d. Do The Dance

**34.**What does XSL stand for?

- a. extra style language
- b. expandable style language
- c. extensible stylesheet language
- d. extensible style listing

**35.**What is a correct way of referring to a stylesheet called "mystyle.xml" ?

- a. `<link type="text/xsl" href="mystyle.xsl" />`
- b. `<?xml-stylesheet type="text/xsl" href="mystyle.xsl" ?>`
- c. `<stylesheet type="text/xsl" href="mystyle.xsl" />`
- d. none of above

**36.** Suppose a div element in a document has `id="answerbox"`. If a JavaScript function sets `d=document.getElementById("answerbox")`, then which of the following is the preferred (best style) way to add a paragraph containing the word "Hello" as a child of that div?

- a. `d.innerHTML = "<p>hello</p>";`
- b. `p = createelement("p");`  
`p.innerHTML = "hello";`  
`d.appendChild(p);`
- c. `answerbox.innerHTML = "hello";`
- d. `d.appendChild("<p>hello</p>");`

**37.** Which statement about the Document Object Model (DOM) is false?

- a. a tag and the html it encloses is one example of a dom node.
- b. every node in the dom, including text nodes, may have child nodes.
- c. the dom regards the document as a hierarchical tree of objects.
- d. each node of the dom is an object with attributes and methods.

**38.** Which of the following is true about typeof operator in JavaScript?

- a. the typeof is a unary operator that is placed before its single operand, which can be of any type.
- b. its value is a string indicating the data type of the operand.
- c. both of the above.
- d. none of the above.

**39.**What is the correct jQuery code to set the background color of all p elements to red?

- a. `$("#p").layout("background-color","red");`
- b. `$("#p").manipulate("background-color","red");`
- c. `$("#p").style("background-color","red");`
- d. `$("#p").css("background-color","red");`

**40.**With jQuery, look at the following selector: `$("#div.intro")`. What does it select?

- a. All div elements with `class="intro"`
- b. The first div element with `class="intro"`
- c. The first div element with `id="intro"`
- d. All div elements with `id="intro"`

**41.**Look at the following selector: `$(":disabled")`. What does it select?

- a. All disabled input elements
- b. All elements that does not contain the text "disabled"
- c. All hidden elements
- d. All elements containing the text "disabled"

**42.**What is the output of this piece of code?

```
var myObject = { 'Paris' : '10',
```

```
'London' : '7',  
  'Berlin' : '5' }  
for (var property in myObject) {  
  document.write(property + '=' +  
myObject[property]+'&');  
}
```

- a. Paris=10
- b. Paris=10&London=7&Berlin=5
- c. Paris=10&London=7&Berlin=5&
- d. No output is generated

**43.**What is the outcome of this piece of code?

```
<html><head></head><body>  
<p id="a1">look at me<p>  
<script type="text/javascript">  
document.getElementById("a1").innerHTML= 'hello  
world';  
</script>  
</body></html>
```

- a. look at me
- b. hello world
- c. nothing is returned
- d. Error message

**44.**What is the console output?

```
var shop = [  
  {product: 'Apple', price: 2.3},  
  {product: 'Peach', price: 3.3},  
  {product: 'Banana', price: 1.3},  
];  
shop.sort(function(a, b) {  
  if (a.product > b.product) {
```

```
        return -1;
    }
    if (a.product < b.product) {
        return 1;
    }
    return 0;
});
var sorted = [];
for (item in shop) {
    sorted.push(shop[item].product);
}
console.log(sorted);
a. ["Peach", "Banana", "Apple"]
b. ["Apple", "Peach", "Banana"]
c. []
d. ["Apple", "Banana", "Peach"]
```

**45.**In what event is HTTP status code 404 returned in response to a certain request?

- a. The server can be reached but the request is denied.
- b. The server can be reached but server can not find what was requested.
- c. An internal server error is generated
- d. The server cannot be reached

**46.**What is name-based virtual hosting?

- a. Name-based virtual hosting is a server configuration allowing multiple IP numbers for every domain name.
- b. Name-based virtual hosting is a server configuration allowing multiple users run a

private server with the characteristics of a dedicated server.

- c. Name-based virtual hosting is a server configuration allowing multiple domain names running on a single IP number
- d. Name-based virtual hosting is a server configuration allowing multiple services (http, pop) running on a single server.

**47.** Which of the following alternatives provides to us a port based Virtual Host?

- a. Listen 6001

```
<VirtualHost *:6001>  
  ServerName internal.site1.com  
  DocumentRoot /var/www/site1  
</VirtualHost>
```

- b. <VirtualHost \*:80>

```
  ServerName internal.site2.com  
  DocumentRoot /var/www/site2  
</VirtualHost>
```

- c. <VirtualHost 192.168.0.50:80>

```
  ServerName internal.site3.com  
  DocumentRoot /var/www/site3  
</VirtualHost>
```

- d. None.

**48.** Which of the following alternatives provides to us an ip-based Virtual Host?

- a. Listen 6001

```
<VirtualHost *:6001>  
  ServerName internal.site1.com  
  DocumentRoot /var/www/site1
```

- ```
</VirtualHost>
```
- b. 

```
<VirtualHost *:80>
```

```
    ServerName internal.site2.com
```

```
    DocumentRoot /var/www/site2
```

```
</VirtualHost>
```
- c. 

```
<VirtualHost 192.168.0.50:80>
```

```
    ServerName internal.site3.com
```

```
    DocumentRoot /var/www/site3
```

```
</VirtualHost>
```
- d. None.

**49.** Which of the alternatives shown below are providing name-based Virtual Host?

- I. Listen 6001  

```
<VirtualHost *:6001>
```

```
    ServerName internal.site1.com
```

```
    DocumentRoot /var/www/site1
```

```
</VirtualHost>
```
  - II. 

```
<VirtualHost *:80>
```

```
    ServerName internal.site2.com
```

```
    DocumentRoot /var/www/site2
```

```
</VirtualHost>
```
  - III. 

```
<VirtualHost 192.168.0.50:80>
```

```
    ServerName internal.site3.com
```

```
    DocumentRoot /var/www/site3
```

```
</VirtualHost>
```
- a. I
  - b. II
  - c. III
  - d. All of them
  - e. None of them

**50.**What is the correct way to include the file "time.inc" ?

- a. `<!-- include file="time.inc" -->`
- b. `<?php include "time.inc"; ?>`
- c. `<?php include file="time.inc"; ?>`
- d. `<?php include:"time.inc"; ?>`

**51.**What is the correct way to open the file "time.txt" as readable?

- a. `open("time.txt");`
- b. `open("time.txt","read");`
- c. `fopen("time.txt","r");`
- d. `fopen("time.txt","r+");`

**52.**How do you create an array in PHP?

- a. `$cars = array["Volvo", "BMW", "Toyota"];`
- b. `$cars = "Volvo", "BMW", "Toyota";`
- c. `$cars = array("Volvo", "BMW", "Toyota");`
- d. `$cars = {"Volvo","BMW","Toyota"};`

**53.**Which of the following is used to check if session variable is already set or not in PHP?

- a. `session_start()` function
- b. `$_SESSION[]`
- c. `isset()` function
- d. `session_destroy()` function

**54.** Which of the following method connect a MySQL database using PHP?

- a. `mysql_connect()`
- b. `mysql_query()`
- c. `mysql_close()`
- d. None of the above

**55.** Which of the following is used to set cookies?

- a. setcookie() function
- b. \$\_COOKIE variable
- c. \$HTTP\_COOKIE\_VARS variable
- d. isset() function

**56.** Using which of the following way can you embed PHP code in an HTML page?

- a. `<?php PHP code goes here ?>`
- b. `<? PHP code goes here ?>`
- c. `<script language="php"> PHP code goes here  
</script>`
- d. All of the above.

**57.** Which of the following is correct about constants?

- a. Unlike with variables, you do not need to have a constant with a \$.
- b. Only scalar data (boolean, integer, float and string) can be contained in constants.
- c. Both of the above.
- d. None of the above.

**58.** Which of the following function is used to locate a string within a string?

- a. search()
- b. locate()
- c. strpos()
- d. None of the above.

**59.** Which of the following is an array containing information such as headers, paths, and script locations?

- a. \$GLOBALS
- b. \$\_SERVER
- c. \$\_COOKIE
- d. \$\_SESSION

**60.** Which of the following is used to delete a cookie?

- a. setcookie() function
- b. \$\_COOKIE variable
- c. isset() function
- d. None of the above.

**61.** Which of the following method can be used to create a MySQL database using PHP?

- a. mysql\_connect()
- b. mysql\_query()
- c. mysql\_close()
- d. None of the above

**62.** Which of the following method acts as a constructor function in a PHP class?

- a. class\_name()
- b. \_\_construct
- c. constructor
- d. None of the above.

**63.** Which of the following can be used to get information sent via get/post method in PHP?

- a. \$\_REQUEST
- b. \$REQUEST
- c. \$REQUEST\_PAGE

d. None of the above

**64.** Which of the following is true about php.ini file?

- a. The PHP configuration file, php.ini, is the final and most immediate way to affect PHP's functionality.
- b. The php.ini file is read each time PHP is initialized.
- c. Both of the above.
- d. None of the above.

**65.** What is the output

```
class OO {  
    public function foo() {  
        return "Hello World!";  
    }  
    public function __call($name, $arguments){  
        return $name;  
    }  
}  
$class = new OO;  
echo $class->bar('do','re','mi');
```

- a. a fatal error
- b. bar
- c. doremi
- d. Hello World

**66.** What is the output?

```
$a = 'b';  
echo " the letter $a ";  
echo ' the letter $a ';
```

- a. the letter the letter \$a

- b. the letter \$a the letter b
- c. the letter b the letter \$a
- d. the letter b the letter b

**67.**What is the output?

```
class Bank {  
    public $deposit = 100;  
    function &getDeposit() {  
        return $this->deposit;  
    }  
}  
$bank = new Bank;  
$stack = &$bank->getDeposit();  
$bank->deposit = 110;  
echo $stack;
```

- a. 110
- b. 100
- c. Nothing
- d. Error

**68.**What is the value of \$answer?

```
$a = 1;  
$b = 0;  
$c = 3;  
if( (!$a && $b) ){  
    if($c > 3 || $b){  
        $answer = 9;  
    } else {  
        $answer = 12;  
    }  
} else {  
    if($b > 1 || $c){  
        $answer = 10;  
    }  
}
```

```
} else {  
    $answer = 7;  
}  
}
```

- a. 7
- b. 12
- c. 10
- d. 9

**69.**What is the outcome of this piece of code?

```
class Transport  
{  
    private $units = 100;  
    protected $capacity = 100;  
}  
class Train extends Transport  
{  
    private $units = 300;  
    protected $capacity = 1000;  
    public function getU()  
    {  
        return $this->units;  
    }  
    public function getC()  
    {  
        return $this->capacity;  
    }  
}  
$train = new Train();  
echo $train->getU()*$train->getC();
```

- a. 300000

- b. 10000
- c. 30000
- d. Nothing

**70.**What is the outcome of this piece of code?

```
class b {  
    public $c = 10;  
    public function &getCount() {  
        return $this->c;  
    }  
}
```

```
$obj = new b;  
$var = &$obj->getCount();  
$obj->c = 22;  
echo $var;
```

- a. null
- b. 10
- c. 22
- d. Fatal Error

**71.**What is the content of variable \$brand?

```
class road {  
    private $data = array();  
    protected $car = "fiat";  
    public function __get($name) {  
        if (array_key_exists($name, $this->data)) {  
            return $this->data[$name]." car"; }  
    }  
    public function __set($key, $value) {  
        $this->data[$key] = $value; }  
    public function __call($name, $arguments) {  
        return 'volvo';  
    }  
}
```

```
}  
}  
$road = new road;  
$road->car = 'porsche';  
$brand = $road->getCar();
```

- a. volvo car
- b. volvo
- c. porsche car
- d. porsche

**72.**In what way can you echo the content of  
www.google.com?

- a. echo fopen('http://www.google.com/');
- b. fopen('http://www.google.com/');
- c. echo include('http://www.google.com/');
- d. echo readfile('http://www.google.com/');
- e. echo  
file\_get\_contents('http://www.google.com/');

**73.**What is the outcome of this piece of code:  
function calc(\$i)

```
{  
  if($i > 0)  
  {  
    echo $i + 12;  
  }  
  else  
  {  
    throw new Exception(  
      "value must be an integer");  
  }  
}
```

```
}
```

```
calc('nine');
```

- Fatal error: Uncaught exception with message value must be an integer
- value must be an integer
- 21
- 12

**74.**What is the outcome of this piece of code:

```
preg_match('/Nov 10(th)?/', 'Today is Nov 10th, 2010',  
$referers);
```

```
var_export($referers);
```

- array ( 0 => 'Nov 10th', )
- array ()
- array ( 0 => 'Nov 10th', 1 => 'th', )
- array ( 0 => 'Nov 10', )

**75.**Analyze the following code:

```
public class Test {  
    public static void main(String[ ] args) {  
        int[ ] x = {1, 2, 3, 4};  
        int[ ] y = x;  
        x = new int[2];  
        for (int i = 0; i < y.length; i++)  
            System.out.print(y[i] + " ");  
    }  
}
```

- The program displays 1 2 3 4
- The program displays 0 0
- The program displays 0 0 0 0

- d. The program displays 0 0 3 4

76. Analyze the following code:

```
public class Test {  
    public static void main(String[] args) {  
        int[] oldList = {1, 2, 3, 4, 5};  
        reverse(oldList);  
        for (int i = 0; i < oldList.length; i++)  
            System.out.print(oldList[i] + " ");  
    }  
    public static void reverse(int[] list) {  
        int[] newList = new int[list.length];  
        for (int i = 0; i < list.length; i++)  
            newList[i] = list[list.length - 1 - i];  
        list = newList;  
    }  
}
```

- a. The program displays 1 2 3 4 5 and then raises an `ArrayIndexOutOfBoundsException`.  
b. The program displays 5 4 3 2 1 and then raises an `ArrayIndexOutOfBoundsException`.  
c. The program displays 5 4 3 2 1.  
d. The program displays 1 2 3 4 5.

77. Analyze the following code.

// Program 1:

```
public class Test {  
    public static void main(String[] args) {  
        Object a1 new A();  
        Object a2 new A();  
        System.out.println(a1.equals(a2));  
    }  
}
```

```
}  
class A {  
    int x;  
    public boolean equals(A a) {  
        return this.x==a.x;  
    }  
}  
// Program 2:  
public class Test {  
    public static void main(String[ ] args) {  
        A a1=new A();  
        A a2=new A();  
        System.out.println(a1.equals(a2));  
    }  
}  
class A {  
    int x;  
    public boolean equals(A a) {  
        return this.x==a.x;  
    }  
}
```

- a. Program 1 displays true and Program 2 displays false
- b. Program 1 displays false and Program 2 displays false
- c. Program 1 displays false and Program 2 displays true
- d. Program 1 displays true and Program 2 displays true

**78.** The `getValue()` method is overridden in two ways.  
Which one is correct?

**I:**

```
public class Test {
    public static void main(String[ ] args) {
        A a=new A();
        System.out.println(a.getValue());
    }
}
class B {
    public String getValue() {
        return "Any object";
    }
}
class A extends B {
    public Object getValue() {
        return "A string";
    }
}
```

**II:**

```
public class Test {
    public static void main(String[ ] args) {
        A a=new A();
        System.out.println(a.getValue());
    }
}
class B {
    public Object getValue() {
        return "Any object";
    }
}
```

```
class A extends B {  
    public String getValue() {  
        return "A string";  
    }  
}
```

- a. I
- b. II
- c. Both I and II
- d. Neither

79. Show the output of running the class Test in the following code:

```
interface A {  
    void print();  
}  
class C {}  
class B extends C implements A {  
    public void print() {}  
}  
public class Test {  
    public static void main(String[] args) {  
        B b = new B();  
        if (b instanceof A)  
            System.out.println("b is an instance of A");  
        if (b instanceof C)  
            System.out.println("b is an instance of C");  
    }  
}
```

- a. Nothing.
- b. "b is an instance of A"

- c. “b is an instance of C”
- d. “b is an instance of A” followed by “b is an instance of C”.

**80.** Given the following code, find the compile error.  
(Choose all that apply.)

```
public class Test {  
    public static void main(String[] args) {  
        m(new GraduateStudent());  
        m(new Student());  
        m(new Person());  
        m(new Object());  
    }  
    public static void m(Student x) {  
        System.out.println(x.toString());  
    }  
}  
class GraduateStudent extends Student {  
}  
class Student extends Person {  
    public String toString() {  
        return “Student”;  
    }  
}  
class Person extends Object {  
    public String toString() {  
        return “Person”;  
    }  
}
```

- a. m(new Object()) causes an error
- b. m(new Person()) causes an error
- c. m(new Student()) causes an error
- d. m(new GraduateStudent()) causes an error

**81.** Given the following classes and their objects:

```
class C1 {};  
class C2 extends C1 {};  
class C3 extends C1 {};  
C2 c2=new C2();  
C3 c3=new C3();
```

Analyze the following statement:

```
c2 = (C2) ((C1) c3);
```

- The statement is correct.
- c3 is cast into c2 successfully.
- You will get a runtime error because you cannot cast objects from sibling classes.
- You will get a runtime error because the Java runtime system cannot perform multiple casting in nested form.

**82.** Analyze the following code:

```
public class Test {  
    public static void main(String[ ] args) {  
        String s new String(“Welcome to Java”);  
        Object o s;  
        String d=(String)o;  
    }  
}
```

- When assigning s to o in Object o s, a new object is created.
- s, o, and d reference the same String object.
- When casting o to s in String d (String)o, the contents of o is changed.
- When casting o to s in String d (String)o, a new object is created.

**83.** What is displayed on the console when running the following program?

```
class Test {
    public static void main(String[ ] args) {
        try {
            method();
            System.out.println("After the
                method call");
        } catch (RuntimeException ex) {
            System.out.println("RuntimeExce
                ption");
        } catch (Exception ex) {
            System.out.println("Exception");
        }
    }
    static void method() throws Exception {
        try {
            String s="5.6";
            Integer.parseInt(s); // Cause a
                NumberFormatException
            int i=0;
            int y=2 / i;
            System.out.println("Welcome to
                Java");
        } catch (NumberFormatException ex) {
            System.out.println("NumberForma
                tException");
            throw ex;
        } catch (RuntimeException ex) {
            System.out.println("RuntimeExce
                ption");
        }
    }
}
```

```
    }  
  }  
}
```

- The program displays `NumberFormatException` followed by `RuntimeException`.
- The program displays `NumberFormatException` followed by `After` the method call.
- The program displays `NumberFormatException` twice.
- The program has a compilation error.

83. The printout from the following code is \_\_\_\_\_.

```
java.util.ArrayList list new java.util.ArrayList();  
list.add("New York");  
java.util.ArrayList list1=list;  
list.add("Atlanta");  
list1.add("Dallas");  
System.out.println(list1);
```

- [New York, Dallas]
- [New York]
- [New York, Atlanta]
- [New York, Atlanta, Dallas]

84. What is the output of the following code:

```
public class Test {  
    public static void main(String[ ] args) {  
        String s1=new String("Java");  
        String s2=new String("Java");  
        System.out.print((s1==s2) + " " +  
            (s1.equals(s2)));  
    }  
}
```

}

- a. false true
- b. true true
- c. false false
- d. true false

**85.**What is the output of running class C?

```
class A {  
    public A() {  
        System.out.print("The default constructor  
of A is invoked ");  
    }  
}  
class B extends A {  
    public B() {  
        System.out.print("The default constructor  
of B is invoked");  
    }  
}  
public class C {  
    public static void main(String[ ] args) {  
        B b=new B();  
    }  
}
```

- a. The default constructor of A is invoked The default constructor of B is invoked
- b. The default constructor of B is invoked The default constructor of A is invoked
- c. The default constructor of B is invoked
- d. The default constructor of A is invoked
- e. Nothing displayed

**86.**What is the output of running class Test?

```
public class Test {
    public static void main(String[] args) {
        new Circle9();
    }
}
public abstract class GeometricObject {
    protected GeometricObject() {
        System.out.print("A");
    }
    protected GeometricObject(String color, boolean
filled) {
        System.out.print("B");
    }
}
public class Circle9 extends GeometricObject {
    public Circle9() {
        this(1.0);
        System.out.print("C");
    }
    public Circle9(double radius) {
        this(radius, white , false);
        System.out.print("D");
    }
    public Circle9(double radius, String color,
boolean filled) {
        super(color, filled);
        System.out.print("E");
    }
}
```

- a. BACD
- b. CBAE

- c. ABCD
- d. BEDC

**87.**What exception type does the following program throw?

```
public class Test {  
    public static void main(String[ ] args) {  
        Object o = null;  
        System.out.println(o);  
    }  
}
```

- a. NullPointerException
- b. ArrayIndexOutOfBoundsException
- c. ArithmeticException
- d. StringIndexOutOfBoundsException
- e. No exception

**88.**What exception type does the following program throw?

```
public class Test {  
    public static void main(String[ ] args) {  
        Object o = null;  
        System.out.println(o.toString());  
    }  
}
```

- a. ClassCastException
- b. NullPointerException
- c. ArithmeticException
- d. ArrayIndexOutOfBoundsException

**89.**What is the output of the following code:

```
public class Test {
```

```
public static void main(String[ ] args) {  
    String s1 = new String("Java");  
    String s2 = new String("Java");  
    System.out.print((s1 == s2) + " " +  
        (s1.equals(s2)));  
    }  
}
```

- a. false true
- b. true true
- c. false false
- d. true false

**90.**What is displayed on the console when running the following program?

```
class Test {  
    public static void main(String[ ] args) {  
        try {  
            method();  
            System.out.println("After the  
                method call");  
        }  
        catch (RuntimeException ex) {  
            System.out.println("RuntimeExcep  
                tion");  
        }  
        catch (Exception ex) {  
            System.out.println("Exception");  
        }  
    }  
    static void method() throws Exception {  
        try {  
            String s = "5.6";
```

```
Integer.parseInt(s); // Cause a
NumberFormatException
int i = 0;
int y = 2 / i;
System.out.println("Welcome to
Java");
}
catch (RuntimeException ex) {
    System.out.println("RuntimeExcep
tion");
}
catch (Exception ex) {
    System.out.println("Exception");
}
}
```

- a. The program displays Exception followed by RuntimeException.
- b. The program displays RuntimeException twice.
- c. The program displays RuntimeException followed by After the method call.
- d. The program displays Exception twice.

**91.**What is displayed on the console when running the following program?

```
class Test {
    public static void main(String[] args) {
        try {
            System.out.println("Welcome to
Java");
            int i = 0;
```

```
        int y = 2/i;
        System.out.println("Welcome to
        Java");
    }
    catch (RuntimeException ex) {
        System.out.println("Welcome to
        Java");
    }
    finally {
        System.out.println("End of the
        block");
    }
}
}
```

- a. The program displays Welcome to Java three times.
- b. The program displays Welcome to Java two times.
- c. The program displays Welcome to Java three times followed by End of the block.
- d. The program displays Welcome to Java two times followed by End of the block.

**92.** What is the output of the following code:

```
public class Test {
    public static void main(String[ ] args) {
        Object o1 = new Object();
        Object o2 = new Object();
        System.out.print((o1 == o2) + " " +
        (o1.equals(o2)));
    }
}
```

- a. false false
- b. true true
- c. true false
- d. false true

93. Which of the following statements is false?

- a. A private method cannot be accessed by a class in a different package.
- b. A protected method can be accessed by a subclass in a different package.
- c. A method with no visibility modifier can be accessed by a class in a different package.
- d. A public class can be accessed by a class from a different package.

94. Object oriented programming allows you to derive new classes from existing classes. This is called \_\_\_\_\_.

- a. inheritance
- b. encapsulation
- c. generalization
- d. abstraction

95. Which of the following classes cannot be extended?

- a. `class A { private A();}`
- b. `final class A { }`
- c. `class A { }`
- d. `class A { protected A();}`

96. Given the declaration `Circle[] x = new Circle[10]`, which of the following statement is most accurate.

- a. x contains an array of ten int values.

- b. x contains a reference to an array and each element in the array can hold a Circle object.
- c. x contains an array of ten objects of the Circle type.
- d. x contains a reference to an array and each element in the array can hold a reference to a Circle object.

**97.** A class design requires that a particular member variable must be accessible by any subclasses of this class, but otherwise not by classes which are not members of the same package. What should be done to achieve this?

- a. The variable should be marked public.
- b. The variable should be marked private and an accessor method provided.
- c. The variable should be marked private.
- d. The variable should have no special access modifier.
- e. The variable should be marked protected.

**98.** Which of the following statements regarding abstract methods is false?

- a. An abstract class can be used as a data type.
- b. An abstract class can have instances created using the constructor of the abstract class.
- c. A subclass can override a concrete method in a superclass to declare it abstract.
- d. An abstract class can be extended.
- e. A subclass of a non-abstract superclass can be abstract.

**99.** Polymorphism means \_\_\_\_\_.

- a. that data fields should be declared private
- b. that a class can contain another class
- c. that a class can extend another class
- d. that a variable of supertype can refer to a subtype object

**100.** The visibility of these modifiers increases in this order:

- a. private, protected, none (if no modifier is used), and public.
- b. private, none (if no modifier is used), protected, and public.
- c. none (if no modifier is used), protected, private, and public.
- d. none (if no modifier is used), private, protected, and public.

**101.** A class design requires that a particular member variable must be accessible by any subclasses of this class, but otherwise not by classes which are not members of the same package. What should be done to achieve this?

- a. The variable should be marked public.
- b. The variable should be marked private and an accessor method provided.
- c. The variable should be marked private.
- d. The variable should have no special access modifier.
- e. The variable should be marked protected.

**102.** Which of the following statements will not convert a string *s* into *i* of int type? (Choose all that

apply.)

- a. `i = Integer.parseInt(s);`
- b. `i = (new Integer(s)).intValue();`
- c. `i = (int)(Double.parseDouble(s));`
- d. `i = Integer.valueOf(s);`
- e. `i = Integer.valueOf(s).intValue();`

**103.** Which of the statements regarding the super keyword is incorrect?

- a. You can use `super.super.p` to invoke a method in superclass's parent class.
- b. You can use `super` to invoke a super class method.
- c. You can use `super` to invoke a super class constructor.
- d. You cannot invoke a method in superclass's parent class.

**104.** Which of the following statements is false?

- a. Dynamic binding can apply to instance methods.
- b. You can always pass an instance of a subclass to a parameter of its superclass type. This feature is known as polymorphism.
- c. The compiler finds a matching method according to parameter type, number of parameters, and order of the parameters at compilation time.
- d. A method may be implemented in several subclasses. The Java Virtual Machine dynamically binds the implementation of the method at runtime.
- e. Dynamic binding can apply to static methods.

**105.** Which of the following statements are false?

- a. An anonymous inner class is an inner class with a name.
- b. An anonymous inner class is compiled into a class named OuterClassName\$.class.
- c. An anonymous inner class must always extend a superclass or implement an interface, but it cannot have an explicit extends or implements clause.
- d. An anonymous inner class must implement all the abstract methods in the superclass or in the interface.
- e. An anonymous inner class always uses the no-arg constructor from its superclass to create an instance. If an anonymous inner class implements an interface, the constructor is Object().

**106.** Which of the following is true?

- a. You can insert an element anywhere in an arraylist.
- b. You should use an array list if your application does not require adding and remove an element anywhere in a list.
- c. You can use a linked list to improve efficiency for adding and remove an element anywhere in a list.
- d. You can insert an element anywhere in a linked list
- e. All of the above are true

**107.** Which is the advantage of encapsulation?

- a. It changes a class's contract without changing the implementation and causes no consequential changes to other code.
- b. Making the class final causes no consequential changes to other code.
- c. Only public methods are needed.
- d. It changes the implementation without changing a class's contract and causes no consequential changes to other code.

**108.** The extension name of a Java bytecode file is

- a. .obj
- b. .exe
- c. .class
- d. .java

**109.** The extension name of a Java source code file is

- a. .java
- b. .exe
- c. .class
- d. .obj