Collection of entrance exam practice questions

FACULTY OF ECONOMICS IN SUBOTICA

University of Novi Sad

MICROECONOMICS

Literature

Mankiw, G. & Taylor, M. P. (2020) “Economics” 5th ed., Cengage
Parts 1 to 9, Units 1 to 19, pages 1 – 415

Questions

Please choose correct answer by circling the letter in front of the statement you find best suits definitions provided.

1 **Economic activity represents:**

a) the amount of buying and selling which takes place in the economy over a period of time;
b) all the production and exchange activities that take place;
c) the human effort, both mental and physical that goes into production;
d) the limited nature of society’s resources.

2 **Capital goods include:**

a) natural resources of the earth;
b) the human effort;
c) computers and cooking ovens;
d) entrepreneurship.

3 **Scarcity is:**

a) the study of how society makes choices;
b) the fact that society has limited resources and therefore cannot produce all the goods and services households demand;
c) the loss of the benefits from a decision to forego or sacrifice one option, balanced against the benefits incurred from the choice made;
d) the comparison of the costs and benefits of alternative courses of action.

4 **Opportunity cost is:**

a) the study of how society manages its scarce resources;
b) the loss of the benefits from a decision to forego or sacrifice one option balanced against the benefits incurred from the choice made;
c) the property of distributing economic prosperity fairly among the members of society;
d) whatever must be given up to obtain some item or the value of the benefits foregone (sacrificed).

5 **In the economics, the term “rational” in the context of decision-making is:**

a) the study of how society makes choices;
b) choosing a course of action such that the marginal cost is equal to the marginal benefit;
c) way in which resources are organized and allocated to provide for the needs of an economy’s citizens;
d) the assumption that decision-makers can make consistent choices between alternatives.

6 **Microeconomics is:**

a) the study of how households and firms make decisions and how they interact in specific markets;
b) the study of economy-wide phenomena;
c) the study of how society makes choices;
d) way in which resources are organized and allocated to provide for the needs of an economy's citizens.

7 **Standard of living is:**

a) the increase in the amount of goods and services in an economy over a period of time;
b) the market value of all goods and services produced within a country in a given period of time divided by the population of a country to give a per capita figure;
c) the amount of goods and services that can be purchased by the population of a country usually measured by the inflation-adjusted (real) income per head of the population;
d) the quantity of goods and services produced from each hour of a worker or factor of production's time.

8 **Neo-classical Economics:**

a) views firms and markets not as entities but as collections of humans, and it is these humans who make decisions;
b) takes the view that the market is a central feature in generating well-being and in answering the three questions all societies have to face;
c) takes the view that the economic well-being is maximized when markets are allowed to do their work and that the government should have a minimal role in the economy;
d) takes that the claims can be tested and confirmed, refuted or shown to not be provable either way.

9 **The market is:**

a) a neo-classical explanation of how resources are allocated;
b) seeking to maximize profit;
c) a group of buyers and sellers of a particular good or service;
d) the most effective way we have yet discovered to allocate scarce resources.

10 **Competitive market is a market in which there are many buyers and sellers so that**

a) each has a significant influence over market price;
b) some have greater influence over market price then others;
c) each has a negligible influence over market price;
d) one has an enormous influence over market price compare to other.

11 **The law of demand claims that:**

a) the demand of a good shifts to the right when the price of a good rises;
b) the demand of a good shifts to the left when the price of a good rises;
c) the quantity demanded of a good rises when the price of a good rises;
d) the quantity demanded of a good falls when the price of a good rises.

12 **An increase in demand is represented graphically as a/an:**

a) increase in quantity demanded due to lower price of a good;
b) shift in the demand curve to the right;
c) shift in the demand curve to the left;
d) decrease in quantity demanded due to higher price of a good.

13 **The substitute goods are two goods for which an:**

a) increase in the price of one leads to a decrease in the demand for the other;
b) increase in the price of one leads to an increase in the demand for the other (and vice versa);
c) increase in income leads to an increase in demand (and vice versa);
d) increase in income leads to a decrease in demand (and vice versa).

14 **The complement goods are two goods for which an:**

a) increase in the price of one leads to a decrease in the demand for the other;
b) increase in the price of one leads to an increase in the demand for the other (and vice versa);
c) increase in income leads to an increase in demand (and vice versa);
d) increase in income leads to a decrease in demand (and vice versa).

15 **The normal goods are two goods for which an:**

a) increase in the price of one leads to a decrease in the demand for the other;
b) increase in the price of one leads to an increase in the demand for the other (and vice versa);
c) increase in income leads to an increase in demand (and vice versa);
d) increase in income leads to a decrease in demand (and vice versa).

16 **The inferior goods are two goods for which an:**

a) increase in the price of one leads to a decrease in the demand for the other;
b) increase in the price of one leads to an increase in the demand for the other (and vice versa);
c) increase in income leads to an increase in demand (and vice versa);
d) increase in income leads to a decrease in demand (and vice versa).

17 **A key non-price determinant of a demand is:**

a) advertising;
b) expectation of customers;
c) taste;
d) the size and the structure of population.

18 **The law of supply claims that:**

a) the supply of a good shifts to the right when the price of a good rises;
b) the supply of a good shifts to the left when the price of a good rises;
c) the quantity supplied of a good rises when the price of a good rises;
d) the quantity supplied of a good falls when the price of a good rises.

19 **A decrease in supply is represented graphically as a/an:**

a) increase in quantity supplied due to lower price of a good;
b) shift in the supply curve to the right;
c) shift in the supply curve to the left;
d) decrease in quantity supplied due to higher price of a good.

20 **Technology could be regarded as:**

a) the factor affecting supply other than price;
b) the increase or decrease in supply as a result of a change in the price holding;
c) a movement along the supply curve;
d) a slope - upwards from left to right.

21 **An equilibrium is:**

a) a situation in which the quantity supplied is greater than the quantity demanded at the going market price;
b) a state of rest in a market, a point where there is no force acting for change;
c) the quantity bought and sold at the equilibrium price;
d) a situation in which quantity demanded is greater than quantity supplied at the going market price.

22 **Situation in which the quantity demanded is greater than the quantity supplied at the going price at the market is called:**

a) normal;
b) equilibrium;
c) shortage;
d) surplus.

23 **Situation in which the quantity supplied is greater than the quantity demanded at the going price at the market is called:**

a) normal;
b) equilibrium;
c) shortage;
d) surplus.

24 **Elasticity is:**

a) a measure of the responsiveness of quantity demanded or quantity supplied to one of its determinants;
b) the quantity bought and sold at the equilibrium price;
c) an increase in the price of one good that leads to an increase in the demand for the other good (and vice versa);
d) an increase in quantity supplied due to lower price of a good.

25 **Price elasticity of a demand is a measure of how much quantity:**

a) demanded of a good responds to a change in the price of that good, computed as the percentage change in quantity demanded divided by the percentage change in price;
b) demanded of a good responds to a change in consumers' income, computed as the percentage change in quantity demanded divided by the percentage change in income;
c) demanded of one good responds to a change in the price of another good, computed as the percentage change in quantity demanded of the first good divided by the percentage change in the price of the second good;
d) supplied of a good responds to a change in the price of that good, computed as the percentage change in quantity supplied divided by the percentage change in price.

26 **Income elasticity of a demand is a measure of how much quantity:**

a) demanded of a good responds to a change in the price of that good, computed as the percentage change in quantity demanded divided by the percentage change in price;
b) demanded of a good responds to a change in consumers' income, computed as the percentage change in quantity demanded divided by the percentage change in income;
c) demanded of one good responds to a change in the price of another good, computed as the percentage change in quantity demanded of the first good divided by the percentage change in the price of the second good;
d) supplied of a good responds to a change in the price of that good, computed as the percentage change in quantity supplied divided by the percentage change in price.

27 **Cross-Price elasticity of a demand is a measure of how much quantity:**

a) demanded of a good responds to a change in the price of that good, computed as the percentage change in quantity demanded divided by the percentage change in price;
b) demanded of a good responds to a change in consumers' income, computed as the percentage change in quantity demanded divided by the percentage change in income;
c) demanded of one good responds to a change in the price of another good, computed as the percentage change in quantity demanded of the first good divided by the percentage change in the price of the second good;
d) supplied of a good responds to a change in the price of that good, computed as the percentage change in quantity supplied divided by the percentage change in price.

28 **Price elasticity of a supply is a measure of how much quantity:**

a) demanded of a good responds to a change in the price of that good, computed as the percentage change in quantity demanded divided by the percentage change in price;
b) demanded of a good responds to a change in consumers' income, computed as the percentage change in quantity demanded divided by the percentage change in income;
c) demanded of one good responds to a change in the price of another good, computed as the percentage change in quantity demanded of the first good divided by the percentage change in the price of the second good;
d) supplied of a good responds to a change in the price of that good, computed as the percentage change in quantity supplied divided by the percentage change in price.

29 **If the price elasticity equals 0 demand is:**

a) perfectly inelastic;
b) inelastic;
c) elastic;
d) perfectly elastic.

30 **If the price elasticity equals ∞ demand is:**

a) perfectly inelastic;
b) inelastic;
c) elastic;
d) perfectly elastic.

31 **The term "value" is referred to:**

a) the worth to an individual of owning an item represented by the satisfaction derived from its consumption and their willingness to pay to own it;
b) the satisfaction derived from the consumption of a certain quantity of a product;
c) the amount consumers are prepared to pay to secure the benefits of consuming the product;
d) the consumption bundles that the consumer can afford given a specified income.

32 **The term "utility" is referred to:**

a) the worth to an individual of owning an item represented by the satisfaction derived from its consumption and their willingness to pay to own it;
b) the satisfaction derived from the consumption of a certain quantity of a product;
c) the amount consumers are prepared to pay to secure the benefits of consuming the product;
d) the consumption bundles that the consumer can afford given a specified income.

33 **The principle "willingness to Pay" is referred to:**

a) the worth to an individual of owning an item represented by the satisfaction derived from its consumption and their willingness to pay to own it;
b) the satisfaction derived from the consumption of a certain quantity of a product;
c) the amount consumers are prepared to pay to secure the benefits of consuming the product;
d) the consumption bundles that the consumer can afford given a specified income.

34 **The budget constraint is:**

a) a curve that shows consumption bundles that give the consumer the same level of satisfaction;
b) a set of alternatives available to a consumer;
c) the limit on the consumption bundles that a consumer can afford;
d) the satisfaction derived from the consumption of a certain quantity of a product.

35 **The indifference curve is:**

a) a curve that shows consumption bundles that give the consumer the same level of satisfaction;
b) a set of alternatives available to a consumer;
c) the limit on the consumption bundles that a consumer can afford;
d) the satisfaction derived from the consumption of a certain quantity of a product.

36 **The correct property of indifference curve is:**

a) lower Indifference curves (closer origin) are preferred to higher ones;
b) indifference curves are upwards sloping;
c) indifference curves can cross each other;
d) indifference curves are Bowed Inwards (convex).

37 **Total utility is:**

a) the satisfaction consumers gain from consuming a product;
b) the increase in utility the consumer gains from an additional (marginal) unit of that good;
c) the tendency for the additional satisfaction from consuming extra units of a good to fall;
d) the rate at which the consumer is willing to substitute one good for the other.

38 **Marginal utility is:**

a) the satisfaction consumers' gain from consuming a product;
b) the increase in utility the consumer gains from an additional (marginal) unit of that good;
c) the tendency for the additional satisfaction from consuming extra units of a good to fall;
d) the rate at which the consumer is willing to substitute one good for the other.

39 **Diminishing marginal utility is:**

a) the satisfaction consumers' gain from consuming a product;
b) the increase in utility the consumer gains from an additional (marginal) unit of that good;
c) the tendency for the additional satisfaction from consuming extra units of a good to fall;
d) the rate at which the consumer is willing to substitute one good for the other.

40 **Marginal rate of substitution is:**

a) the satisfaction consumers' gain from consuming a product;
b) the increase in utility the consumer gains from an additional (marginal) unit of that good;
c) the tendency for the additional satisfaction from consuming extra units of a good to fall;
d) the rate at which the consumer is willing to substitute one good for the other.

41 **Perfect substitutes are goods that could be presented graphically as:**

a) two goods with straight line indifference curves;
b) two goods with right angle indifference curves;
c) two goods with convex indifference curves;
d) two goods with concave indifference curves.

42 **Perfect complements are goods that could be presented graphically as:**

a) two goods with straight line indifference curves;
b) two goods with right angle indifference curves;
c) two goods with convex indifference curves;
d) two goods with concave indifference curves.

43 **The relationship between the quantity of inputs used to make a good and the quantity of output of that good is:**

a) production function;
b) efficient scale;
c) marginal cost;
d) diminishing marginal product.

44 **Total product is:**

a) the increase in the quantity of output in sum;
b) the increase in the quantity of output obtained from one additional unit of that factor input;
c) the relationship between the quantity of inputs used to make a good and the quantity of output of that good;
d) the property whereby the marginal product of an input declines as the quantity of the input increases.

45 **Marginal product is:**

a) the increase in the quantity of output in total;
b) the increase in the quantity of output obtained from one additional unit of that factor input;
c) the relationship between the quantity of inputs used to make a good and the quantity of output of that good;
d) the property whereby the marginal product of an input declines as the quantity of the input increases.

46 **Diminishing marginal product is:**

a) the increase in the quantity of output in total;
b) the increase in the quantity of output obtained from one additional unit of that factor input;
c) the relationship between the quantity of inputs used to make a good and the quantity of output of that good;
d) the property whereby the marginal product of an input declines as the quantity of the input increases.

47 **Fixed costs are:**

a) costs that are not determined by the quantity of output produced;
b) costs that are dependent on the quantity of output produced;
c) total cost divided by the quantity of output;
d) the increase in total cost that arises from an extra unit of production.

48 **Variable costs are:**

a) costs that are not determined by the quantity of output produced;
b) costs that are dependent on the quantity of output produced;
c) total cost divided by the quantity of output;
d) the increase in total cost that arises from an extra unit of production.

49 **Average costs are:**

a) costs that are not determined by the quantity of output produced;
b) costs that are dependent on the quantity of output produced;
c) total cost divided by the quantity of output;
d) the increase in total cost that arises from an extra unit of production.

50 **Marginal costs are:**

a) costs that are not determined by the quantity of output produced;
b) costs that are dependent on the quantity of output produced;
c) total cost divided by the quantity of output;
d) the increase in total cost that arises from an extra unit of production.

51 **The quantity of output that minimizes average total costs is:**

a) marginal cost;
b) diminishing marginal product;
c) efficient scale;
d) production function.

52 **Constant returns to scale is the property of cost curve whereby long-run average total cost:**

a) stays the same as the quantity of output changes;
b) falls as the quantity of output increases;
c) rises as the quantity of output increases.

53 **Economies of scale is the property of cost curve whereby long-run average total cost:**

a) stays the same as the quantity of output changes;
b) falls as the quantity of output increases;
c) rises as the quantity of output increases.

54 **Diseconomies of scale is the property of cost curve whereby long-run average total cost:**

a) stays the same as the quantity of output changes;
b) falls as the quantity of output increases;
c) rises as the quantity of output increases.

55 **Total revenue is:**

a) Q x P;
b) total revenue divided by the quantity sold;
c) the change in total revenue from an additional unit sold.

56 **Average revenue is:**

a) Q x P;
b) total revenue divided by the quantity sold;
c) the change in total revenue from an additional unit sold.

57 **Marginal revenue is:**

a) Q x P;
b) total revenue divided by the quantity sold;
c) the change in total revenue from an additional unit sold.

58 **A short-run decision not to produce anything during a specific period of time because of current market conditions, for a firm in a competitive markets occurs at:**

a) P = AVC;
b) P > AVC;
c) P < AVC;
d) P ≥ AVC.

59 **A short-run decision to enter the market due to current market conditions, for a firm in a competitive markets occurs at:**

a) P < AVC;
b) P ≤ AVC;
c) P = AVC;
d) P > AVC.

60 **Welfare economics is:**

a) the study of how the allocation of resources affects economic well-being;
b) the way in which people evaluate their own happiness;
c) measures of the quality of life using specified indicators;
d) a resource allocation where the value of the output by sellers matches the value placed on that output by buyers.

61 **Subjective well-being is:**

a) the study of how the allocation of resources affects economic well-being;
b) the way in which people evaluate their own happiness;
c) measures of the quality of life using specified indicators;
d) a resource allocation where the value of the output by sellers matches the value placed on that output by buyers.

62 **Objective well-being is:**

a) the study of how the allocation of resources affects economic well-being;
b) the way in which people evaluate their own happiness;
c) measures of the quality of life using specified indicators;
d) a resource allocation where the value of the output by sellers matches the value placed on that output by buyers.

63 **Allocative efficiency is:**

a) the study of how the allocation of resources affects economic well-being;
b) the way in which people evaluate their own happiness;
c) measures of the quality of life using specified indicators;
d) a resource allocation where the value of the output by sellers matches the value placed on that output by buyers.

64 **Consumer surplus is:**

a) an interaction resulting in an agreed outcome between two interested and competing economic agents;
b) the value of everything a seller must give up to produce a good;
c) the amount a seller is paid for a good minus the seller's cost;
d) a buyer's willingness to pay minus the amount the buyer actually pays.

65 **Producer surplus is:**

a) a buyer's willingness to pay minus the amount the buyer actually pays;
b) an interaction resulting in an agreed outcome between two interested and competing economic agents;
c) the value of everything a seller must give up to produce a good;
d) the amount a seller is paid for a good minus the seller's cost.

66 **Indirect tax is:**

a) a tax levied on the sale of goods and services;
b) a fixed rate tax levied on goods and services expressed as a sum per unit;
c) a tax levied as a percentage of the price of a good;
d) the way in which the burden of a tax is shared among participants in a market.

67 **Specific tax is:**

a) a tax levied on the sale of goods and services;
b) a fixed rate tax levied on goods and services expressed as a sum per unit;
c) a tax levied as a percentage of the price of a good;
d) the way in which the burden of a tax is shared among participants in a market.

68 **Ad valorem tax is:**

a) a tax levied on the sale of goods and services;
b) a fixed rate tax levied on goods and services expressed as a sum per unit;
c) a tax levied as a percentage of the price of a good;
d) the way in which the burden of a tax is shared among participants in a market.

69 **Tax incidence is:**

a) a tax levied on the sale of goods and services;
b) a fixed rate tax levied on goods and services expressed as a sum per unit;
c) a tax levied as a percentage of the price of a good;
d) the way in which the burden of a tax is shared among participants in a market.

70 **One of four principles or canons of a good tax system that states "each person should pay taxes according to their ability to pay, so that the rich should pay more in taxes than the poor" is:**

a) equality;
b) certainty;
c) convenience;
d) economic principle.

71 **One of four principles or canons of a good tax system that states "taxpayers need to know what taxes they are liable for and be able to plan ahead on this basis. At the same time governments should be able to have some certainty in how much they are able to collect in taxes" is:**

a) equality;
b) certainty;
c) convenience;
d) economic principle.

72 **One of four principles or canons of a good tax system that states "paying taxes should be made as easy as possible, and tax systems should be designed to be as simple as possible to help maximize tax revenue" is:**

a) equality;
b) certainty;
c) convenience;
d) economic principle.

73 **One of four principles or canons of a good tax system that states "any tax system must ensure that the cost of collecting and administering taxes is less than the amount collected" is:**

a) equality;
b) certainty;
c) convenience;
d) economic principle.

74 **Benefits principle is:**

a) the idea that people should pay taxes based on benefits they receive from government services;
b) a tax that is the same amount for every person;
c) the extra taxes paid on an additional unit of income;
d) total taxes paid divided by total income.

75 **A lump-sum tax is:**

a) the idea that people should pay taxes based on benefits they receive from government services;
b) a tax that is the same amount for every person;
c) the extra taxes paid on an additional unit of income;
d) total taxes paid divided by total income.

76 **Marginal tax rate is:**

a) the idea that people should pay taxes based on benefits they receive from government services;
b) a tax that is the same amount for every person;
c) the extra taxes paid on an additional unit of income;
d) total taxes paid divided by total income.

77 **Average tax rate is:**

a) the idea that people should pay taxes based on benefits they receive from government services;
b) a tax that is the same amount for every person;
c) the extra taxes paid on an additional unit of income;
d) total taxes paid divided by total income.

78 **Private goods are:**

a) goods that are both excludable and rival;
b) goods that are neither excludable nor rival;
c) goods that are rival but not excludable;
d) goods that are excludable but non-rival in consumption.

79 **Public goods are:**

a) goods that are both excludable and rival;
b) goods that are neither excludable nor rival;
c) goods that are rival but not excludable;
d) goods that are excludable but non-rival in consumption.

80 **Common resources are:**

a) goods that are both excludable and rival;
b) goods that are neither excludable nor rival;
c) goods that are rival but not excludable;
d) goods that are excludable but non-rival in consumption.

81 **Club goods are:**

a) goods that are both excludable and rival;
b) goods that are neither excludable nor rival;
c) goods that are rival but not excludable;
d) goods that are excludable but non-rival in consumption.

82 **A situation when an economic agent engages in an activity that influences the well-being of a bystander (a third party) who neither pays nor receives any compensation for that effect is called:**

a) an externality;
b) a well-being;
c) an efficient allocation of resources;
d) a market equilibrium.

83 **Internalizing an externality is:**

a) altering incentives so that people take account of the external effects of their actions;
b) the cost imposed on a third party of a decision;
c) the benefits to a third party of a decision;
d) purchases or decisions which alter the context of the evaluation by an individual of the positional good.

84 **Negative externality is:**

a) altering incentives so that people take account of the external effects of their actions;
b) the cost imposed on a third party of a decision;
c) the benefits to a third party of a decision;
d) purchases or decisions which alter the context of the evaluation by an individual of the positional good.

85 **Positive externality is:**

a) altering incentives so that people take account of the external effects of their actions;
b) the cost imposed on a third party of a decision;
c) the benefits to a third party of a decision;
d) purchases or decisions which alter the context of the evaluation by an individual of the positional good.

86 **Positional externality is:**

a) altering incentives so that people take account of the external effects of their actions;
b) the cost imposed on a third party of a decision;
c) the benefits to a third party of a decision;
d) purchases or decisions which alter the context of the evaluation by an individual of the positional good.

87 **Government failure is:**

a) a situation where political power and incentives distort decision-making so that decisions are made which conflict with economic efficiency;
b) making decisions based on a principle where the maximum benefit is gained by the largest number of people at minimum cost;
c) the analysis of governmental behaviour, and the behaviour of individuals who interact with government;
d) the tendency of a voter to not seek out information to make an informed choice in elections.

88 **Public interest is:**

a) a situation where political power and incentives distort decision-making so that decisions are made which conflict with economic efficiency;
b) making decisions based on a principle where the maximum benefit is gained by the largest number of people at minimum cost;
c) the analysis of governmental behaviour, and the behaviour of individuals who interact with government;
d) the tendency of a voter to not seek out information to make an informed choice in elections.

89 **Public choice theory is:**

a) a situation where political power and incentives distort decision-making so that decisions are made which conflict with economic efficiency;
b) making decisions based on a principle where the maximum benefit is gained by the largest number of people at minimum cost;
c) the analysis of governmental behaviour, and the behaviour of individuals who interact with government;
d) the tendency of a voter to not seek out information to make an informed choice in elections.

90 **Rational ignorance effect is:**

a) a situation where political power and incentives distort decision-making so that decisions are made which conflict with economic efficiency;
b) making decisions based on a principle where the maximum benefit is gained by the largest number of people at minimum cost;
c) the analysis of governmental behaviour, and the behaviour of individuals who interact with government;
d) the tendency of a voter to not seek out information to make an informed choice in elections.

91 **Production isoquant is:**

a) a function representing all possible combinations of factor inputs that can be used to produce a given level of output;
b) the rate at which one factor input can be substituted for another at a given level of output;
c) a line showing the different combination of factor inputs which can be purchased with a given budget;
d) the Least-cost Input combination.

92 **Marginal rate of technical substitution is:**

a) a function representing all possible combinations of factor inputs that can be used to produce a given level of output;
b) the rate at which one factor input can be substituted for another at a given level of output;
c) a line showing the different combination of factor inputs which can be purchased with a given budget;
d) the Least-cost Input combination.

93 **Isocost line is:**

a) a function representing all possible combinations of factor inputs that can be used to produce a given level of output;
b) the rate at which one factor input can be substituted for another at a given level of output;
c) a line showing the different combination of factor inputs which can be purchased with a given budget;
d) the Least-cost Input combination.

94 **The point where the isoquant is tangential to the given budget constraint is:**

a) a function representing all possible combinations of factor inputs that can be used to produce a given level of output;
b) the rate at which one factor input can be substituted for another at a given level of output;
c) a line showing the different combination of factor inputs which can be purchased with a given budget;
d) the Least-cost Input combination.

95 **Imperfect competition exists where firms:**

a) can differentiate their product in some way, however do not have influence over price;
b) can not differentiate their product in some way, however do have influence over price;
c) can not differentiate their product in some way, and do not have influence over price;
d) can differentiate their product in some way, and have some influence over price.

96 **The inefficiency of monopoly:**

a) charging a price above marginal cost, the quantity produced and sold by a monopoly is below the socially efficient level;
b) the business practice of selling the same good at different prices to different customers;
c) the process of buying a good in one market at a low price and selling it in another market at a higher price to profit from the price difference;
d) a situation in which the monopolist knows exactly the willingness to pay of each customer and can charge each customer a different price.

97 **The price discrimination:**

a) charging a price above marginal cost, the quantity produced and sold by a monopoly is below the socially efficient level;
b) the business practice of selling the same good at different prices to different customers;
c) the process of buying a good in one market at a low price and selling it in another market at a higher price to profit from the price difference;
d) a situation in which the monopolist knows exactly the willingness to pay of each customer and can charge each customer a different price.

98 **The arbitrage:**

a) charging a price above marginal cost, the quantity produced and sold by a monopoly is below the socially efficient level;
b) the business practice of selling the same good at different prices to different customers;
c) the process of buying a good in one market at a low price and selling it in another market at a higher price to profit from the price difference;
d) a situation in which the monopolist knows exactly the willingness to pay of each customer and can charge each customer a different price.

99 **The perfect price discrimination:**

a) charging a price above marginal cost, the quantity produced and sold by a monopoly is below the socially efficient level;
b) the business practice of selling the same good at different prices to different customers;
c) the process of buying a good in one market at a low price and selling it in another market at a higher price to profit from the price difference;
d) a situation in which the monopolist knows exactly the willingness to pay of each customer and can charge each customer a different price.

100 **A monopolistic competition is a market structure in which:**

a) many firms sell products that are similar but not identical;
b) only a few sellers offer similar or identical products and dominate the market;
c) entry and exit are free and costless;
d) a firm is the sole seller of a product without close substitutes.

101 **The concentration ratio is:**

a) the proportion of total market share accounted for by a particular number of firms;
b) the proportion of total sales in a market accounted for by a particular firm;
c) a firm that is the sole seller of a product without close substitutes;
d) anything which prevents a firm from entering a market or industry.

102 **Market share**

a) the proportion of total market share accounted for by a particular number of firms;
b) the proportion of total sales in a market accounted for by a particular firm;
c) a firm that is the sole seller of a product without close substitutes;
d) anything which prevents a firm from entering a market or industry.

103 **Monopoly is:**

a) the proportion of total market share accounted for by a particular number of firms;
b) the proportion of total sales in a market accounted for by a particular firm;
c) a firm that is the sole seller of a product without close substitutes;
d) anything which prevents a firm from entering a market or industry.

104 **Barriers to entry:**

a) the proportion of total market share accounted for by a particular number of firms;
b) the proportion of total sales in a market accounted for by a particular firm;
c) a firm that is the sole seller of a product without close substitutes;
d) anything which prevents a firm from entering a market or industry.

105 **An oligopoly is a market structure in which:**

a) many firms sell products that are similar but not identical;
b) only a few sellers offer similar or identical products and dominate the market;
c) entry and exit are free and costless;
d) a firm is the sole seller of a product without close substitutes.

106 **Term “market segments” refers to the:**

a) breaking down of customers into groups with similar buying habits or characteristics;
b) the proportion of total market share accounted for by a particular number of firms;
c) the proportion of total sales in a market accounted for by a particular firm;
d) trying to differentiate its products to meet different customer needs.

107 **Collusion is:**

a) an agreement among firms in a market about quantities to produce or prices to charge;
b) a group of firms acting in unison;
c) a situation in which economic actors interacting with one another each choose their best strategy given the strategies that all the other actors have chosen;
d) a strategy to raise production and capture a larger share of the market.

108 **Cartel is:**

a) an agreement among firms in a market about quantities to produce or prices to charge;
b) a group of firms acting in unison;
c) a situation in which economic actors interacting with one another each choose their best strategy given the strategies that all the other actors have chosen;
d) a strategy to raise production and capture a larger share of the market.

109 **Nash equilibrium is:**

a) an agreement among firms in a market about quantities to produce or prices to charge;
b) a group of firms acting in unison;
c) a situation in which economic actors interacting with one another each choose their best strategy given the strategies that all the other actors have chosen;
d) a strategy to raise production and capture a larger share of the market.

110 **Game theory is:**

a) the study of how people behave in strategic situations;
b) a table showing the possible combination of outcomes (payoffs) depending on the strategy chosen by each player;
c) a particular 'game' between two captured prisoners that illustrates why cooperation is difficult to maintain even when it is mutually beneficial;
d) a strategy that is best for a player in a game regardless of the strategies chosen by the other players.

111 **In game theory, a payoff matrix is:**

a) the study of how people behave in strategic situations;
b) a table showing the possible combination of outcomes (payoffs) depending on the strategy chosen by each player;
c) a particular 'game' between two captured prisoners that illustrates why cooperation is difficult to maintain even when it is mutually beneficial;
d) a strategy that is best for a player in a game regardless of the strategies chosen by the other players.

112 **In game theory, a "prisoner's dilemma" is:**

a) the study of how people behave in strategic situations;
b) a table showing the possible combination of outcomes (payoffs) depending on the strategy chosen by each player;
c) a particular 'game' between two captured prisoners that illustrates why cooperation is difficult to maintain even when it is mutually beneficial;
d) a strategy that is best for a player in a game regardless of the strategies chosen by the other players.

113 **In game theory, a dominant strategy is:**

a) the study of how people behave in strategic situations;
b) a table showing the possible combination of outcomes (payoffs) depending on the strategy chosen by each player;
c) a particular 'game' between two captured prisoners that illustrates why cooperation is difficult to maintain even when it is mutually beneficial;
d) a strategy that is best for a player in a game regardless of the strategies chosen by the other players.

114 **Contestable market is:**

a) a market in which there are many buyers and sellers so that each has a negligible influence over market price;
b) a firm that is the sole seller of a product without close substitutes;
c) a market structure in which only a few sellers offer similar or identical products and dominate the market;
d) a term emphasising that entry and exit are free and costless.

115 **Economies of scope is:**

a) a situation where a firm's average cost of production is reduced as a result of the production of a variety of products which can share factor inputs;
b) a situation allowing a firm's average total cost curve to decline as its scale increases, usually leading to what is called a natural monopoly;
c) a situation where a firm will keep prices lower than they could be to deter new entrants;
d) the advantages firms can gain over another which have the characteristics of being both distinctive and defensible.

116 **Economies of scale is:**

a) a situation where a firm's average cost of production is reduced as a result of the production of a variety of products which can share factor inputs;
b) a situation allowing a firm's average total cost curve to decline as its scale increases, usually leading to what is called a natural monopoly;
c) a situation where a firm will keep prices lower than they could be to deter new entrants;
d) the advantages firms can gain over another which have the characteristics of being both distinctive and defensible.

117 **Entry limit pricing is:**

a) a situation where a firm's average cost of production is reduced as a result of the production of a variety of products which can share factor inputs;
b) a situation allowing a firm's average total cost curve to decline as its scale increases, usually leading to what is called a natural monopoly;
c) a situation where a firm will keep prices lower than they could be to deter new entrants;
d) the advantages firms can gain over another which have the characteristics of being both distinctive and defensible.

118 **Competitive advantage is:**

a) a situation where a firm's average cost of production is reduced as a result of the production of a variety of products which can share factor inputs;
b) a situation allowing a firm's average total cost curve to decline as its scale increases, usually leading to what is called a natural monopoly;
c) a situation where a firm will keep prices lower than they could be to deter new entrants;
d) the advantages firms can gain over another which have the characteristics of being both distinctive and defensible.

119 **Derived demand is:**

a) a situation where demand is determined by the supply in another market, usually factor market;
b) the increase in the amount of output from an additional unit of labour;
c) the extra revenue a firm gets from hiring an additional unit of a factor of production;
d) the value of labours' marginal contribution to the production of goods and services.

120 **The marginal product is:**

a) a situation where demand is determined by the supply in another market, usually factor market;
b) the increase in the amount of output from an additional unit of labour;
c) the extra revenue a firm gets from hiring an additional unit of a factor of production;
d) the value of labours' marginal contribution to the production of goods and services.

121 **The marginal revenue product is:**

a) a situation where demand is determined by the supply in another market, usually factor market;
b) the increase in the amount of output from an additional unit of labour;
c) the extra revenue a firm gets from hiring an additional unit of a factor of production;
d) the value of labours' marginal contribution to the production of goods and services.

122 **The price of labour (wage) is:**

a) a situation where demand is determined by the supply in another market, usually factor market;
b) the increase in the amount of output from an additional unit of labour;
c) the extra revenue a firm gets from hiring an additional unit of a factor of production;
d) the value of labours' marginal contribution to the production of goods and services.

123 **According to the Marxist labour theory, socially necessary time is:**

a) the quantity of labour necessary under average conditions of labour productivity to produce a given commodity;
b) labour used in the past to produce capital goods and raw materials used in the production of a good;
c) labour utilized in the production of the good itself;
d) the notion that most goods have some use in consumption and are purchased because they have some value to the consumer.

124 **According to the Marxist labour theory, dead labour time is:**

a) the quantity of labour necessary under average conditions of labour productivity to produce a given commodity;
b) labour used in the past to produce capital goods and raw materials used in the production of a good;
c) labour utilized in the production of the good itself;
d) the notion that most goods have some use in consumption and are purchased because they have some value to the consumer.

125 **According to the Marxist labour theory, living labour time is:**

a) the quantity of labour necessary under average conditions of labour productivity to produce a given commodity;
b) labour used in the past to produce capital goods and raw materials used in the production of a good;
c) labour utilized in the production of the good itself;
d) the notion that most goods have some use in consumption and are purchased because they have some value to the consumer.

126 **A monopsony is a market structure in which:**

a) many firms sell products that are similar but not identical;
b) only a few sellers offer similar or identical products and dominate the market;
c) a market in which there is a single (or dominant) buyer;
d) a firm is the sole seller of a product without close substitutes.

127 **A compensating differential is:**

a) a difference in wages that arises to offset the non-monetary characteristics of different jobs;
b) the accumulation of investments in people, such as education and on-the-job training;
c) the lowest price an employer may legally pay to a worker;
d) an hourly rate set independently, based on an estimation of minimum household needs which provide an 'acceptable' standard of living in an economy.

128 **Human capital is:**

a) a difference in wages that arises to offset the non-monetary characteristics of different jobs;
b) the accumulation of investments in people, such as education and on-the-job training;
c) the lowest price an employer may legally pay to a worker;
d) an hourly rate set independently, based on an estimation of minimum household needs which provide an 'acceptable' standard of living in an economy.

129 **A minimum wage is:**

a) a difference in wages that arises to offset the non-monetary characteristics of different jobs;
b) the accumulation of investments in people, such as education and on-the-job training;
c) the lowest price an employer may legally pay to a worker;
d) an hourly rate set independently, based on an estimation of minimum household needs which provide an 'acceptable' standard of living in an economy.

130 **A living wage is:**

a) a difference in wages that arises to offset the non-monetary characteristics of different jobs;
b) the accumulation of investments in people, such as education and on-the-job training;
c) the lowest price an employer may legally pay to a worker;
d) an hourly rate set independently, based on an estimation of minimum household needs which provide an 'acceptable' standard of living in an economy.

131 **A union is:**

a) a worker association that bargains with employers over wages and working conditions;
b) the organized withdrawal of labour from a firm by a union;
c) above-equilibrium wages paid by firms to increase worker productivity;
d) the lowest price an employer may legally pay to a worker.

132 **A strike is:**

a) a worker association that bargains with employers over wages and working conditions;
b) the organized withdrawal of labour from a firm by a union;
c) above-equilibrium wages paid by firms to increase worker productivity;
d) the lowest price an employer may legally pay to a worker.

133 **Efficiency wage is:**

a) a worker association that bargains with employers over wages and working conditions;
b) the organized withdrawal of labour from a firm by a union;
c) above-equilibrium wages paid by firms to increase worker productivity;
d) the lowest price an employer may legally pay to a worker.

134 **Lorenz curve is:**

a) the relationship between the cumulative percentage of households and the cumulative percentage of income;
b) a measure of the degree of inequality of income in a country;
c) the regular pattern of income variation over a person's life;
d) a theory which suggests that consumers will smooth consumption over their lifetime in relation to their anticipated long-term average income.

135 **Gini coefficient is:**

a) the relationship between the cumulative percentage of households and the cumulative percentage of income;
b) a measure of the degree of inequality of income in a country;
c) the regular pattern of income variation over a person's life;
d) a theory which suggests that consumers will smooth consumption over their lifetime in relation to their anticipated long-term average income.

136 **Life cycle is:**

a) the relationship between the cumulative percentage of households and the cumulative percentage of income;
b) a measure of the degree of inequality of income in a country;
c) the regular pattern of income variation over a person's life;
d) a theory which suggests that consumers will smooth consumption over their lifetime in relation to their anticipated long-term average income.

137 **Permanent income hypothesis is:**

a) the relationship between the cumulative percentage of households and the cumulative percentage of income;
b) a measure of the degree of inequality of income in a country;
c) the regular pattern of income variation over a person's life;
d) a theory which suggests that consumers will smooth consumption over their lifetime in relation to their anticipated long-term average income.

138 **Poverty rate is:**

a) the percentage of the population whose family income falls below an absolute level called the poverty line;
b) an absolute level of income set by the government below which a family is deemed to be in poverty;
c) a level of poverty where an individual does not have access to the basics of life – food, clothing and shelter;
d) a situation where an individual is not able to access what would be considered acceptable standards of living in society.

139 **Poverty line is:**

a) the percentage of the population whose family income falls below an absolute level called the poverty line;
b) an absolute level of income set by the government below which a family is deemed to be in poverty;
c) a level of poverty where an individual does not have access to the basics of life – food, clothing and shelter;
d) a situation where an individual is not able to access what would be considered acceptable standards of living in society.

140 **Absolute poverty is:**

a) the percentage of the population whose family income falls below an absolute level called the poverty line;
b) an absolute level of income set by the government below which a family is deemed to be in poverty;
c) a level of poverty where an individual does not have access to the basics of life – food, clothing and shelter;
d) a situation where an individual is not able to access what would be considered acceptable standards of living in society.

141 **Relative poverty is:**

a) the percentage of the population whose family income falls below an absolute level called the poverty line;
b) an absolute level of income set by the government below which a family is deemed to be in poverty;
c) a level of poverty where an individual does not have access to the basics of life – food, clothing and shelter;
d) a situation where an individual is not able to access what would be considered acceptable standards of living in society.

142 **Utilitarianism is:**

a) the political philosophy according to which the government should choose policies to maximize the total utility of everyone in society;
b) the political philosophy according to which the government should choose policies deemed to be just, as evaluated by an impartial observer behind a veil of ignorance;
c) the political philosophy according to which the government should punish crimes and enforce voluntary agreements, but not redistribute income;
d) the theory of the labour market stresses the importance of surplus value which is exploited by owners of factors of production and means that labour does not earn the full value of the work they provide.

143 **Liberalism is:**

a) the political philosophy according to which the government should choose policies to maximize the total utility of everyone in society;
b) the political philosophy according to which the government should choose policies deemed to be just, as evaluated by an impartial observer behind a veil of ignorance;
c) the political philosophy according to which the government should punish crimes and enforce voluntary agreements, but not redistribute income;
d) the theory of the labour market stresses the importance of surplus value which is exploited by owners of factors of production and means that labour does not earn the full value of the work they provide.

144 **Libertarianism is:**

a) the political philosophy according to which the government should choose policies to maximize the total utility of everyone in society;
b) the political philosophy according to which the government should choose policies deemed to be just, as evaluated by an impartial observer behind a veil of ignorance;
c) the political philosophy according to which the government should punish crimes and enforce voluntary agreements, but not redistribute income;
d) the theory of the labour market stresses the importance of surplus value which is exploited by owners of factors of production and means that labour does not earn the full value of the work they provide.

145 **Marxist theory is:**

a) the political philosophy according to which the government should choose policies to maximize the total utility of everyone in society;
b) the political philosophy according to which the government should choose policies deemed to be just, as evaluated by an impartial observer behind a veil of ignorance;
c) the political philosophy according to which the government should punish crimes and enforce voluntary agreements, but not redistribute income;
d) the theory of the labour market stresses the importance of surplus value which is exploited by owners of factors of production and means that labour does not earn the full value of the work they provide.

146 **The production possibilities frontier is:**

a) a graph that shows the combinations of output that the economy can possibly produce given the available factors of production and technology;
b) a situation when a producer can produce a good using fewer factor inputs than another;
c) a situation when each person specializes in producing the good for which they have a comparative advantage, total production in the economy rises;
d) sum of goods produced abroad and purchased for use in the domestic economy leading to an outflow of funds from a country.

147 **In behavioural economics, asymmetric information is viewed as:**

a) a situation where two parties have access to different information;
b) the tendency of a person who is imperfectly monitored to engage in dishonest or otherwise undesirable behaviour;
c) a situation where a principal knows more about their situation than the agent, leading to the agent preferring not to do business with the principal;
d) an action taken by an informed party to reveal private information to an uninformed party.

148 **In behavioural economics, moral hazard is viewed as:**

a) a situation where two parties have access to different information;
b) the tendency of a person who is imperfectly monitored to engage in dishonest or otherwise undesirable behaviour;
c) a situation where a principal knows more about their situation than the agent, leading to the agent preferring not to do business with the principal;
d) an action taken by an informed party to reveal private information to an uninformed party.

149 **In behavioural economics, adverse selection is viewed as:**

a) a situation where two parties have access to different information;
b) the tendency of a person who is imperfectly monitored to engage in dishonest or otherwise undesirable behaviour;
c) a situation where a principal knows more about their situation than the agent, leading to the agent preferring not to do business with the principal;
d) an action taken by an informed party to reveal private information to an uninformed party.

150 **In behavioural economics, signalling is viewed as:**

a) a situation where two parties have access to different information;
b) the tendency of a person who is imperfectly monitored to engage in dishonest or otherwise undesirable behaviour;
c) where a principal knows more about their situation than the agent, leading to the agent preferring not to do business with the principal;
d) an action taken by an informed party to reveal private information to an uninformed party.

PRINCIPLES OF MACROECONOMICS

Literature

Mankiw, Gregory & Taylor, Mark. 2020. Economics, fifth edition. Cengage Learning EMEA. ISBN: 978-1-4737-6854-3.
Part 9 **The data of macroeconomics 433-458**
Part 10 **The real economy in the long-run 463-503**
Part 12 **Short-run economic fluctuations 595-715**

Questions

Please choose correct answer by circling the letter in front of the statement you find best suits definitions provided.

1 **The General Theory of Employment, Interest and Money, published in 1936, has influenced subsequent generations of economists and it is the most important book written by:**

a) Milton Friedman
b) Menger, Jevons and Walras
c) Karl Marx
d) John Maynard Keynes

2 **Measuring GDP in two ways will arrive at the same result:**

a) Income and expenditure
b) Government expenditure and savings
c) Consumer spending and net export
d) Investments and income

3 **What is the circular flow of income?**

a) A model which describes all the transactions between households and firms in a simple economy
b) A model which describes the relationship between Government spending, investment spending and revenue from exports
c) A model which describes all the transactions related to exports and imports (net-exports)
d) A model which describes the relationship between savings and investments in a simple economy

4 **GDP includes only:**

a) intermediate goods
b) the value of final goods
c) the value of inventory
d) aggregate supply

5 **Components of the GDP are:**

a) Consumption (C) - spending by households on goods and services, including purchases of new housing; investment (I) - spending on capital equipment, inventories and structures, including household purchases of new housing; government spending (G) - spending on goods and services by local and national governments, and net exports – NX

b) Consumption (C) - spending by households on goods and services, with the exception of purchases of new housing, investment (I) - spending on capital equipment, inventories and structures, including household purchases of new housing, government spending (G) - spending on goods and services by local and national governments, and savings (S)

c) Government consumption (C) - spending by Government on goods and services, investment (I) - spending on capital equipment, inventories and structures, excluding household purchases of new housing, government spending (G) - spending on goods and services by local and national governments, and net exports – NX

d) Consumption (C) - spending by households on goods and services, with the exception of purchases of new housing; investment (I) - spending on capital equipment, inventories and structures, including household purchases of new housing; Government spending (G) - spending on goods and services by local and national governments; and net exports – NX

6 **Real GDP is the production of goods and services:**

a) valued at constant prices - calculated by multiplying the output of goods and services by the price of those goods and services in the reporting year

b) valued at market prices - using prices that existed at a particular base year

c) valued at constant prices - using prices that existed at a particular base year

d) valued at market prices - calculated by multiplying the output of goods and services by the price of those goods and services in the reporting year

7 **GDP deflator is a measure of:**

a) the price level calculated as the ratio of real GDP to nominal GDP times 100

b) the price level calculated as the ratio of nominal GDP to real GDP times 100

c) the production of goods and services valued at current prices

d) the production of goods and services valued at constant prices

8 **A measure of the overall prices of the goods and services bought by a typical consumer is:**

a) real GDP

b) consumer price index

c) producer price index

d) cost of living

9 **An important difference between GDP deflator and Consumer price index is:**

a) The GDP deflator reflects the prices of all goods and services produced domestically, whereas the CPI reflects the prices of all goods and services bought by consumers

b) The GDP deflator reflects the prices of all goods and services produced internationally, whereas the CPI reflects the prices of all goods and services bought by consumers

c) The CPI compares the price of a different basket of goods and services with the price of the basket in the base year

d) The GDP deflator compares the prices of different baskets of goods and services with the price of the basket in the base year

10 **The interest rate that the savings account pays is called the nominal interest rate, and the interest rate corrected for inflation is called:**

a) international interest rate
b) real interest rate
c) interest rate non-corrected for the effects of inflation
d) indexed interest rate

11 **What is meant by the term GDP per capita and how is it measured?**

a) GDP per capita takes the level of real GDP at a point in time and divides it by the population to get a measure of income per head of the population
b) Economic growth – rate of GDP per capita growth
c) GDP per capita takes the level of real GDP at a point in time and divides it by the unemployed population to get a measure of income per head
d) Real GDP per worker - GDP per capita takes the level of real GDP at a point in time and divides it by the income of the worker

12 **Why is CPI an imperfect measure of the cost of living?**

a) It does not consider consumers' ability to substitute for goods that become relatively cheaper over time
b) It considers increases in the purchasing power of money due to the introduction of new goods
c) It is affected by the same quality of goods and services
d) Because of these measurement problems

13 **Is productivity determined by?**

a) Aggregate production function and investment
b) Physical capital, human capital, natural resources, technological knowledge
c) Steady-state equilibrium
d) Level of democracy achieved human capital and knowledge

14 **What is the catch-up effect?**

a) workers in rich countries have large amounts of capital with which to work, and this partly explains their high productivity
b) countries that start off rich tend to grow more rapidly than countries that start off poor
c) countries that start off poor tend to grow more rapidly than countries that start off rich
d) catching the richest economies

15 **A capital investment that is owned and operated by a foreign entity is called:**

a) foreign direct investment
b) foreign portfolio investment
c) investment
d) savings

16 **The aggregate production function provides:**

a) a model for showing how income/output can grow when more inputs of capital and labour are used and how improvements in technology can make those factor inputs more productive
b) a model for showing how income/output can grow when more outputs of capital and labour are used and how improvements in technology can make those factor inputs less productive way
c) increases in technology that can be a public good
d) A model developed as it referred to as endogenous growth theory

17 **Business cycle implies fluctuations in economic activity such as employment and production. The period of declining real incomes and rising unemployment is:**

a) Recession
b) Depression
c) Peak
d) Trough

18 **When output, employment and other variables such as retail sales or manufacturing production begin to decline together, it is:**

a) Recession
b) Depression
c) Peak
d) Trough

19 **When output, employment and other variables such as retail sales or manufacturing production begin to rise together, it is:**

a) Recession
b) Depression
c) Peak
d) Trough

20 **When real output is lower than the previous time period, that is:**

a) depression - a severe recession
b) peak - a point where related economic variables begin to decline
c) contraction - when real output is lower than the previous time period
d) amplitude - the difference between peak and trough and trend output

21 **Comovements may exhibit certain relationships; when a variable is above trend, when GDP is above trend, the variable is said to be:**

a) Procyclical
b) Countercyclical
c) Stationary
d) Non-stationary

22 **If a variable is below trend when GDP is above trend, the variable is described as:**

a) Procyclical
b) Countercyclical
c) Stationary
d) Non-stationary

23 **Procyclical variables are:**

a) Real wages, while countercyclical are inflation, employment, interest rate
b) Unemployment rate, while countercyclical are inflation, employment, interest rate
c) Inflation, employment, interest rate, while the countercyclical is unemployment
d) Unemployment, while countercyclical are inflation, employment, interest rate

24 **The supply-side (new classical) model of the economy is related to the operation of the labour market. It is assumed that:**

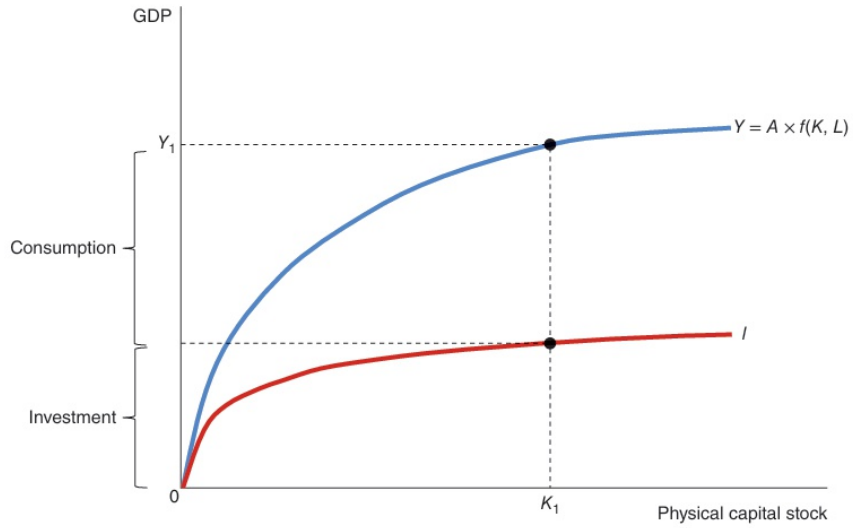
a) workers have perfect information, the labour market clears
b) unanticipated price changes, workers have perfect information
c) anticipated price changes, workers have perfect information
d) the labour market clears, but that workers have imperfect information

25 **Autonomous spending is:**

a) consumption spending
b) investment spending
c) spending by government
d) spending which is not dependent on income/output

26 **Following figure shows:**

a) deflationary gap - there is insufficient demand to maintain full employment output - the government would need to shift the expenditure line;
b) inflationary gap - the equilibrium is higher than full employment output – the economy does not have the capacity to meet demand;
c) autonomous spending - this is the component of expenditure which does not depend on income/output – government spending being a key element of this expenditure;
d) the aggregate production function which is determined by technology and capital and labour productivity for a given level of physical capital stock.



27 **Cyclical indicators can be with three characteristics:**

a) a leading indicators - where the indicator tends to foretell future changes in economic activity; a lagging indicator - whose changes occur after changes in economic activity have occurred; coincident indicators - whose changes occur at the same time as changes in economic activity
b) a lagging indicators - where the indicator tends to foretell future changes in economic activity; a leading indicator - whose changes occur after changes in economic activity have occurred; coincident indicators - whose changes occur at the same time as changes in economic activity
c) procyclical - a variable that is below trend when GDP is above trend; countercyclical - a variable that is below trend when GDP is above trend; comovements - the movement of pairs of variables
d) procyclical - a variable that is below trend when GDP is above trend; countercyclical - a variable that is above trend when GDP is below trend; comovements - the movement of pairs of variables

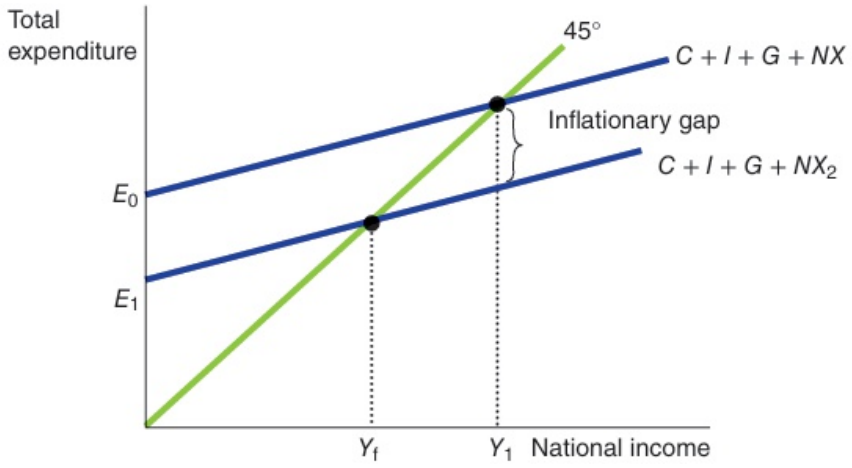
28 **In the model shown by figure:**

a) government needs to shift the C+I+G+NX line down to C+I+G+NX2 to eliminate the inflationary gap, because the equilibrium is higher than full employment output

b) government needs to shift the C+I+G+NX line down to C+I+G+NX2 to eliminate the inflationary gap, because the equilibrium is lower than full employment output

c) government needs to shift the C+I+G+NX2 line up to C+I+G+NX to eliminate the inflationary gap, because the equilibrium is lower than full employment output

d) government needs to shift the C+I+G+NX2 line up to C+I+G+NX to eliminate the deflationary gap, because the equilibrium is lower than full employment output



29 **The difference between full employment output and expenditure when expenditure is less than full employment output is called:**

a) deflationary gap

b) inflationary gap

c) multiplier effect

d) aggregate demand

30 **The difference between full employment output and actual expenditure when actual expenditure is greater than full employment output is called:**

a) deflationary gap

b) inflationary gap

c) multiplier effect

d) aggregate demand

31 **The additional shifts in aggregate demand that result when expansionary fiscal policy increases income and thereby increases consumer spending is called:**

a) deflationary gap

b) inflationary gap

c) multiplier effect

d) aggregate demand

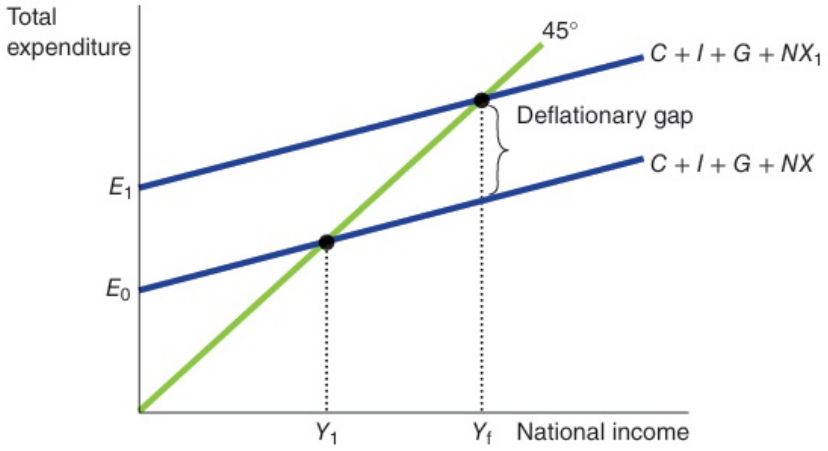
32 **In the model showed by figure:**

a) government needs to shift the C+I+G+NX line down to C+I+G+NX1 to eliminate the inflationary gap, because the equilibrium is higher than full employment output

b) government needs to shift the C+I+G+NX line up to C+I+G+NX1 to eliminate the deflationary gap, because the equilibrium is lower than full employment output

c) government needs to shift the C+I+G+NX2 line up to C+I+G+NX to eliminate the inflationary gap, because the equilibrium is lower than full employment output

d) government needs to shift the C+I+G+NX2 line up to C+I+G+NX to eliminate the deflationary gap, because the equilibrium is lower than full employment output



33 **The IS curve shows:**

a) an inverse relationship between the interest rate and output – a fall in interest rates leads to a rise in national income and vice versa

b) a direct relationship between the interest rate and output – a rise in interest rates leads to a rise in national income and vice versa

c) a direct relationship between the interest rate and output – a fall in interest rates leads to a fall in national income and vice versa

d) a positive slope - an increase in national income is associated with an increase in the interest rate and vice versa

34 **The LM curve has:**

a) an inverse relationship between the interest rate and output – a fall in interest rates leads to a rise in national income and vice versa

b) a direct relationship between the interest rate and output – a rise in interest rates leads to a rise in national income and vice versa

c) a direct relationship between the interest rate and output – a fall in interest rates leads to a fall in national income and vice versa

d) a positive slope - an increase in national income is associated with an increase in the interest rate and vice versa

35 **General equilibrium using the IS–LM model is:**

a) Equilibrium in the economy is found where the IS curve intersects with the LM curve - at this point both the goods market and the money market are in equilibrium
b) Equilibrium in the economy is found where the IS curve intersects with the LM curve - at this point neither the goods market nor the money market is in equilibrium
c) Equilibrium in the economy is found where the AS curve intersects with the AD curve - at this point both the goods market and the money market are in equilibrium
d) Equilibrium in the economy is found where the AS curve intersects with the AD curve - at this point neither the goods market nor the money market is in equilibrium

36 **A rise in government spending shifts:**

a) LM curve to the left
b) IS curve to the left
c) LM curve to the right
d) IS curve to the right

37 **If the central bank decides to expand the money supply, it means shifts of:**

a) LM curve to the left
b) IS curve to the left
c) LM curve to the right
d) IS curve to the right

38 **The inverse relationship between the price level and national income could be represented by:**

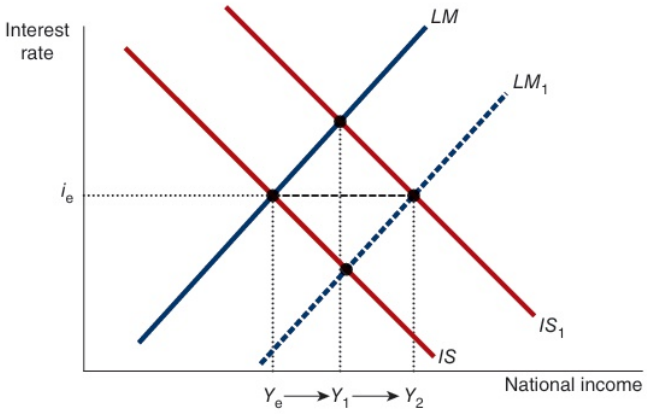
a) AS curve
b) AD curve
c) IS curve
d) LM curve

39 **Changes in both fiscal and monetary policy, assuming a given constant price level, will cause:**

a) the AS curve to shift
b) the AD curve to shift
c) the IS curve to shift
d) the LM curve to shift

40 **The figure shows:**

a) Shifts of the LM curve and IS curve due to changes of the AD curve
b) Shifts of the LM curve and IS curve due to fiscal policy effects
c) Shifts of the LM curve and IS curve due to fiscal and monetary policy interactions
d) Shifts of the LM curve and IS curve due to monetary policy effects



41 **To keep the unemployment rate steady, real GDP needs to grow at or close to its potential is the base for the:**

a) AS-AD model
b) IS-LM model
c) Okun's law
d) Aggregate production function

42 **A curve that shows the quantity of goods and services that households, firms and the government want to buy at each price level is called:**

a) LM curve
b) IS curve
c) aggregate demand – AD curve
d) aggregate supply – AS curve

43 **A curve that shows the quantity of goods and services that firms choose to produce and sell at each price level is called:**

a) LM curve
b) IS curve
c) aggregate demand – AD curve
d) aggregate supply – AS curve

44 **The level of AD is determined by the sum of:**

a) consumption (C), investment (I), government purchases (G) and net exports (NX)
b) unanticipated and anticipated price changes
c) real wages, inflation, employment and interest rate
d) all the transactions related to exports and imports (NX)

45 **The downwards slope of the AD curve could be explained by:**

a) shifts arising from investment and consumption
b) the wealth effect, the interest rate effect, the exchange rate effect
c) shifts arising from government purchases and net exports
d) monetary policy

46 **The aggregate demand – AD curve might shift because of:**

a) shifts arising from LM curve
b) the wealth effect, the interest rate effect, the exchange rate effect
c) shifts arising from consumption, investments, government purchases and net exports
d) monetary policy

47 **The output level in an economy when all existing factors of production (land, labour, capital and technology resources) are fully utilized and where unemployment is at its natural rate is called:**

a) natural rate of unemployment
b) natural rate of output
c) output gap
d) short-run aggregate supply curve

48 **The long-run AS curve could arise from the following sources:**

a) shifts arising from labour, capital, natural resources, and technological knowledge
b) monetary and fiscal policy
c) real wages, inflation, employment and interest rate
d) all the transactions related to exports and imports (NX)

49 **The theory that emphasizes that the prices of some goods and services also adjust sluggishly in response to changing economic conditions is called:**

a) misperceptions theory
b) sticky wage theory
c) sticky price theory
d) neoclassical theory

50 **The theory that emphasizes that nominal wages are slow to adjust or are 'sticky' in the short run is called:**

a) misperceptions theory
b) sticky wage theory
c) sticky price theory
d) neoclassical theory

51 **Which of the following factors would lead to an increase in aggregate supply?**

a) a rise in interest rates
b) an increase in oil prices
c) a reduction in business taxes
d) a decrease in wages

53 **According to the aggregate supply and demand model, an increase in the money supply would most likely lead to:**

a) a shift of the aggregate supply curve to the right
b) a shift of the aggregate demand curve to the left
c) a movement up along the aggregate demand curve
d) a shift of the aggregate demand curve to the right

54 **Which of the following best describes the long-run aggregate supply (LRAS)?**

a) it is vertical because it reflects an economy's potential output at full employment
b) it slopes upward because it represents the total output at various price levels
c) it slopes downward because of diminishing returns to labour
d) it shifts leftward as the economy experiences growth

55 **A leftward shift in the aggregate demand curve can result from:**

a) a decrease in the price level
b) an increase in government spending
c) a decrease in the money supply
d) an increase in exports

56 **A decrease in the price level would lead to the following changes in the economy.**

a) a movement down along the aggregate demand curve
b) a shift of the aggregate demand curve to the right
c) a shift of the aggregate supply curve to the left
d) a movement up along the aggregate supply curve

57 **A key characteristic of the aggregate demand curve is:**

a) it is upward sloping due to the wealth effect
b) it shows the relationship between the price level and the total quantity of output demanded
c) it is perfectly inelastic because the central bank controls demand
d) it shifts to the right as the interest rate rises

58 **The "sticky wages" theory explains why the short-run aggregate supply curve is upward sloping by suggesting that:**

a) wages adjust quickly to changes in demand
b) wages and prices do not adjust immediately in the short run, causing firms to produce more at higher price levels
c) firms are unwilling to hire more workers at higher wages
d) wage increases lead to a reduction in aggregate supply

59 **A recessionary gap exists when:**

a) aggregate supply exceeds aggregate demand
b) the price level is too high for equilibrium output
c) the economy's output is below its full-employment level
d) the government reduces its spending

60 **In the short run, shifts in AD cause:**

a) fluctuations in the economy's output of goods and services, while in the long run, shifts in AD affect the overall price level but do not affect output.
b) stagflation - a period of falling output and rising prices, while in the long run, shifts in AD affect the overall price level but do not affect output.
c) fluctuations in the economy's output of goods and services, while in the long run, stagflation - a period of falling output and rising prices
d) fluctuations in the economy's output of goods and services, while in the long run, inflation - a period of rising prices

61 **Shifts in AS can cause:**

a) fluctuations in the economy's output of goods and services, while in the long run, shifts in AD affect the overall price level but do not affect output.
b) stagflation - a period of falling output and rising prices, while in the long run, shifts in AS affect the overall price level but do not affect output.
c) stagflation – a combination of recession (falling output) and inflation (rising prices).
d) stagflation - a period of falling output and rising prices, while in the long run, shifts in AD affect the overall price level but do not affect output.

62 **AD curve slopes downwards for three reasons:**

a) an increase in money supply, lower taxes and government spending increase
b) the wealth effect, the interest rate effect and exchange rate effect
c) an increase in government spending, a decrease in the money supply, and an increase in exports
d) the wealth effect, the interest rate effect and sticky price effect

63 **Keynes' theory that the interest rate adjusts to bring money supply and money demand into balance is called:**

a) the theory of liquidity preference
b) misperceptions theory
c) sticky wage theory
d) sticky price theory

64 **Automatic stabilizers are:**

a) changes in monetary policy that stimulate AD when the economy goes into a recession, without policymakers having to take any deliberate action
b) changes in fiscal policy that stimulate AD when the economy goes into a recession, without policymakers having to take any deliberate action
c) changes in fiscal policy that stimulate AD when the economy goes into a recession guided by policymakers
d) changes in monetary policy that stimulate AD when the economy goes into a recession guided by policymakers

65 **How do automatic stabilizers help to stabilize the economy?**

a) By increasing government spending when the economy is in a boom
b) By decreasing taxes automatically when the economy is doing poorly
c) By automatically reducing government spending during an economic expansion
d) By smoothing fluctuations in aggregate demand without any government intervention

66 **Which of the following is an example of an automatic stabilizer in the economy?**

a) A government stimulus check issued during a recession
b) A decrease in interest rates by the central bank
c) Unemployment benefits that increase during a downturn
d) A tax cut passed by the government

67 **Which of the following is an effect of automatic stabilizers during an economic expansion?**

a) They automatically increase taxes, reducing disposable income
b) They automatically reduce government spending, lowering aggregate demand
c) They increase government transfers to maintain economic stability
d) They decrease income taxes to stimulate spending

68 **The balanced budget is:**

a) the total sum of money received by a government in tax revenue and interest is equal to the amount it spends, including any debt interest owing
b) all the transactions related to exports and imports
c) Tax revenue exceeds government spending
d) Government borrowing decreases

69 **A curve that shows the short-run trade-off between inflation and unemployment:**

a) AS curve
b) Phillips curve
c) AD curve
d) LM curve

70 **Rational expectations are related to:**

a) a model which states that individuals and organizations base their expectations of inflation in the future on past actual inflation rates
b) the theory according to which people optimally use all the information they have, including information about government policies, when forecasting the future
c) the points of annual output lost in the process of reducing inflation by one percentage point
d) the reduction in the rate of inflation

71 **Adaptive expectations are related to:**

a) the theory according to which people optimally use all the information they have, including information about government policies, when forecasting the future
b) the points of annual output lost in the process of reducing inflation by one percentage point
c) the reduction in the rate of inflation
d) a model which states that individuals and organizations base their expectations of inflation in the future on past actual inflation rates

72 **What does the circular flow diagram illustrate?**

a) The distribution of wealth among different countries
b) The transactions between the government and foreign firms
c) The transactions between households and firms in a simple economy
d) The movement of goods through international trade

73 **In the market for goods and services, what do households do?**

a) Provide land and capital
b) Buy goods and services from firms
c) Collect taxes from firms
d) Produce goods for the government

74 **Which of the following are examples of factor incomes received by households?**

a) Imports, taxes, and savings
b) Sales, purchases, and trade
c) Wages, rent, interest, and profit
d) Revenues, expenses, and debts

75 **What are exports (X) considered in the circular flow model?**

a) Leakages
b) Injections
c) Transfers
d) Revenues only for the government

76 **Which of the following are considered injections in the circular flow model?**

a) Taxes, imports, and savings
b) Wages, rent, and interest
c) Government spending, investment, and exports
d) Imports, exports, and savings

77 **The total number of workers, including both the employed and the unemployed is called**

_____

78 **The percentage of the labour force that is unemployed measured by dividing the number of unemployed by the labour force and multiplying by 100 is _____**

79 **_____ is capital investment that is owned and operated by a foreign entity.**

80 **A theory that the rate of economic growth in the long run is determined by the rate of growth in total factor productivity, and this total factor productivity is dependent on the rate at which technology progresses is:**

a) Keynesian theory
b) endogenous growth theory
c) misperceptions theory
d) sticky wage theory

81 **The point in a growing economy where investment spending is the same as spending on depreciation and the capital–output ratio remains constant is called:**

a) steady-state equilibrium
b) short-run equilibrium
c) long-run equilibrium
d) aggregate production function

82 **Why is GDP per capita useful?**

a) It shows the government's income from taxes
b) It allows income comparisons across countries
c) It measures investment per business
d) It calculates inflation rates

83 **The interest rate as usually reported without a correction for the effects of inflation is _____**

84 **The interest rate corrected for the effects of inflation is _____**

85 **What is the GDP deflator?**

a) The ratio of exports to imports
b) The ratio of nominal GDP to real GDP
c) The difference between CPI and interest rates
d) A measure of government spending

86 **What is real GDP?**

a) Income earned by workers
b) Current output valued at base year prices
c) GDP including only goods, not services
d) The same as nominal GDP

87 **One key difference between the GDP deflator and the CPI is that:**

a) The CPI includes all goods produced domestically
b) The GDP deflator includes only imported goods
c) The CPI includes government spending
d) The GDP deflator includes all domestically produced goods and services, while the CPI includes only what consumers buy

88 **A measure of the overall prices of the goods and services bought by a typical consumer is _____**

89 **Why do some argue that higher GDP still contributes to well-being?**

a) Because GDP directly measures happiness
b) Because nations with larger GDPs can afford better healthcare and education
c) Because GDP includes spiritual and cultural values
d) Because it includes all unpaid work

90 **A measure of the price level calculated as the ratio of nominal GDP to real GDP times 100 is _____**

91 **Spending on domestically produced goods and services by foreigners (exports) minus spending on foreign goods by domestic residents (imports) is called _____**

92 **Transfer payments are counted as part of government spending?**

a) only for national governments spending
b) only for local government spending
c) yes
d) no

93 **Spending on capital equipment, inventories and structures, including household purchases of new housing are:**

a) foreign direct investments
b) consumption
c) government spending
d) investment

94 **A period of declining real incomes and rising unemployment - occurring after two successive quarters of negative economic growth is called _____**

95 **Periods of expansion and slowdown are called in economics _____**

96 **What are leading indicators?**

a) Indicators that tend to predict future changes in economic activity
b) Indicators that respond after economic changes occur
c) Indicators unrelated to business cycles
d) Indicators used only for government budgets

97 **What is a lagging indicator?**

a) An indicator that predicts economic trends
b) An indicator that changes after economic activity has already changed
c) An indicator that shows monthly employment data
d) A coincident measure of current income

98 **What characterizes coincident indicators?**

a) They are used to predict inflation
b) Their changes occur at the same time as changes in economic activity
c) They are published by central banks only
d) They track foreign exchange rates

99 **Which of the following is an example of an unpredictable external shock?**

a) A tax cut
b) A natural disaster like a tsunami or earthquake
c) A company merger
d) An infrastructure investment

100 **What role do governments play in influencing economic activity?**

a) They manage all private firms
b) They control tax rates and infrastructure spending
c) They only regulate inflation
d) They issue company profits

101 **How can interest rate changes affect the economy?**

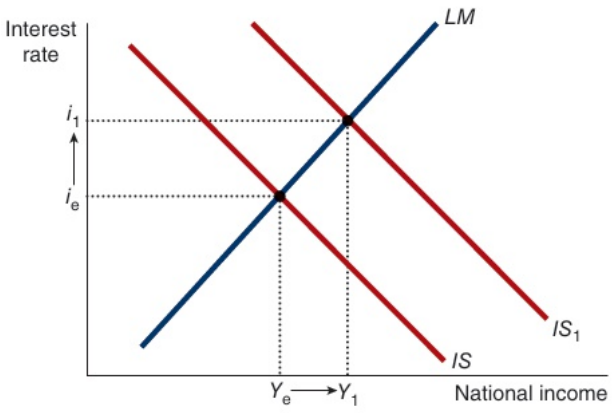
a) They only impact exports
b) They influence only government revenues
c) They affect credit availability for households and businesses
d) They reduce government debt

102 **How do expectations influence worker behaviour?**

a) Workers ignore economic forecasts
b) Workers only focus on their current wages
c) Workers reduce their productivity automatically
d) Workers may demand wage increases based on expected inflation

103 **The following figure shows:**

a) a decline in government spending or taxes cut which shifts the IS curve to the right resulting in a new equilibrium with a higher interest rate and level of national income
b) a rise in government spending or taxes cut which shifts the IS curve to the right resulting in a new equilibrium with a higher interest rate and level of national income
c) an increase in the money supply which shifts the LM curve to the right and a new equilibrium result in a lower interest rate and higher level of national income
d) a decrease in the money supply which shifts the LM curve to the right and a new equilibrium result in a lower interest rate and higher level of national income



(a)

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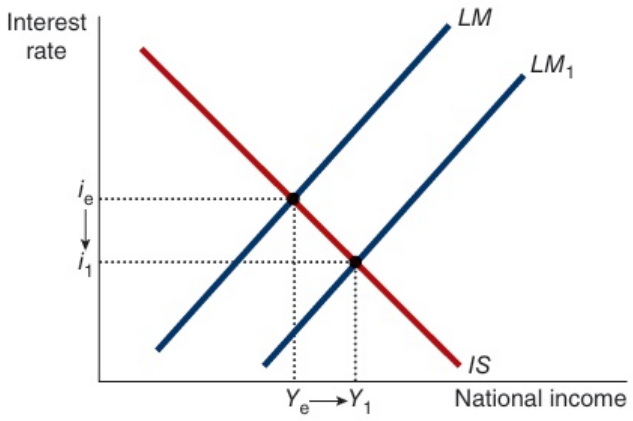
c) an increase in the money supply which shifts the LM curve to the right and a new equilibrium result in a lower interest rate and higher level of national income

d) a decrease in the money supply which shifts the LM curve to the right and a new equilibrium result in a lower interest rate and higher level of national income



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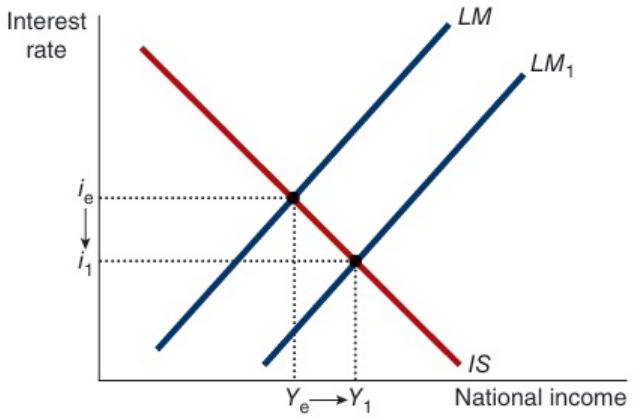
c) an increase in the money supply which shifts the LM curve to the right and a new equilibrium result in a lower interest rate and higher level of national income

d) fiscal and monetary policy interactions which effects on increase in national income



106 **According to classical macroeconomic theory, changes in the money supply affect which of the following?**

a) Real GDP
b) Real interest rate
c) Nominal variables only
d) Unemployment

107 **What concept refers to the separation between real and nominal variables?**

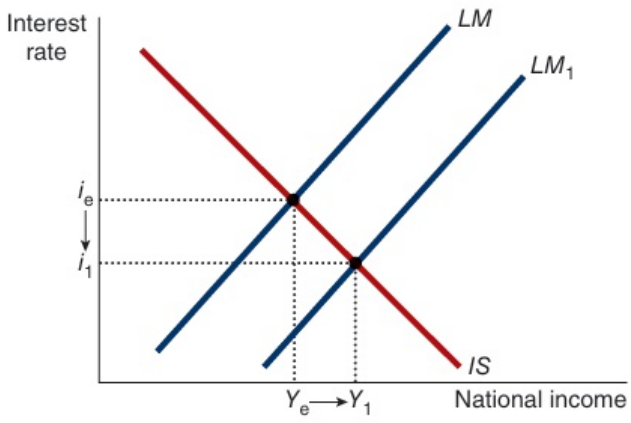
a) Classical dichotomy
b) Monetary neutrality
c) Fiscal policy
d) Purchasing power parity

108 **What happens when the assumption of monetary neutrality no longer applies?**

a) Inflation becomes impossible
b) Changes in the money supply can influence real output
c) Exchange rates are fixed
d) Money no longer serves as a unit of account

109 **The following figure shows:**

a) a model of aggregate demand and aggregate supply - economists use this model to explain short-run fluctuations in economic activity around its long-run trend
b) IS curve - a curve that shows the quantity of goods and services that households, firms and the government want to buy at each price level
c) LM curve - aggregate supply curve a curve that shows the quantity of goods and services that firms choose to produce and sell at each price level
d) IS-LM model



110 **Which component of aggregate demand is assumed to be fixed by government policy in the short run?**

a) Investment
b) Net exports
c) Government purchases
d) Consumption

111 **According to the interest rate effect, what happens when the price level falls?**

a) Households demand more money
b) Interest rates rise
c) Households hold less money and interest rates fall
d) Investment decreases

112 **How does a lower interest rate affect investment?**

a) It reduces borrowing by firms and households
b) It encourages more borrowing for investment
c) It causes inflation to rise
d) It increases government spending

113 **What happens to net exports when the domestic currency depreciates?**

a) Imports increase and exports decrease
b) Exports increase and imports decrease
c) Both exports and imports increase
d) Net exports remain unchanged

114 **What happens to the aggregate demand curve if people decide to save more and consume less?**

a) It shifts to the left
b) It becomes vertical
c) It shifts to the right
d) It does not change

115 **If firms become pessimistic about the economy's future, how does that affect the AD curve?**

a) It becomes vertical
b) It shifts to the left
c) It shifts to the right
d) It rotates upward

116 **If the government increases spending on public infrastructure like roads, what is the impact on the AD curve?**

a) The AD curve shifts to the left
b) The AD curve shifts to the right
c) The AD curve stays in place
d) The AD curve becomes flatter

117 **The output level in an economy when all existing factors of production (land, labour, capital and technology resources) are fully utilized and where unemployment is at its natural rate is called _____**

118 **The Long-Run Aggregate Supply (LRAS) curve represents the total output an economy can produce when using all its resources efficiently. The LRAS curve is:**

a) horizontal
b) vertical
c) with a positive slope
d) with a negative slope

119 **What happens to the LRAS curve if the natural rate of unemployment rises?**

a) It remains unchanged
b) It shifts to the right
c) It shifts to the left
d) It becomes flatter

120 **How do natural resources affect the LRAS curve?**

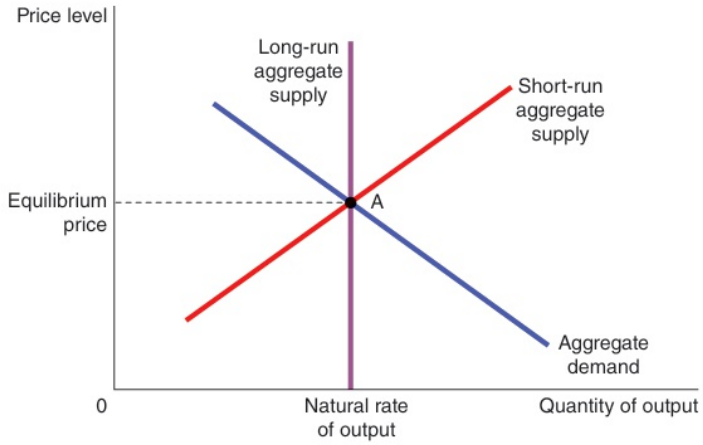
a) They do not affect it
b) Only imported resources can shift the LRAS curve
c) A discovery of new natural resources shifts it to the right
d) Technological changes in agriculture shift it to the left

121 **How does technological progress affect the LRAS curve?**

a) It makes the curve steeper
b) It shifts the LRAS curve to the right
c) It increases inflation in the short run
d) It reduces the need for natural resources

122 **The following figure shows:**

a) the short-run aggregate demand
b) aggregate production function
c) steady-state equilibrium
d) the long-run equilibrium



123 **What is stagflation?**

a) A period of high growth and high inflation
b) A period of high inflation and low output
c) A period of low inflation and low output
d) A period of high employment and stable prices

124 **What is the result of policymakers shifting the AD curve to the right to counter stagflation?**

a) Output remains at the natural rate, but the price level increases
b) Output increases above the natural rate, and inflation falls
c) Both output and the price level fall
d) The economy enters a deflationary spiral

125 **According to Keynes, what balances the interest rate?**

a) Government spending
b) Inflation and deflation
c) Supply and demand for money
d) Demand for goods and services

126 **Who controls the supply of money in the economy?**

a) Private banks
b) The central bank
c) The stock exchange
d) Commercial investors

127 **Why does the AD curve slope downward, according to the interest rate effect?**

a) Higher prices raise interest rates, reducing investment and consumption
b) Higher prices cause more exports
c) Lower prices reduce wages and shift AS
d) More government spending pulls AD down

128 **What is the multiplier effect?**

a) A fall in prices causes multiple increases in supply
b) An initial spending increase causes a greater total increase in AD
c) A rise in taxes multiplies consumer savings
d) The money supply doubles with each fiscal policy change

129 **What is the crowding-out effect?**

a) Government spending leads to higher exports
b) Increased taxes reduce government revenue
c) Fiscal policy leads to inflation crowding out savings
d) Government spending raises interest rates, reducing investment

130 **Where does the short-run Phillips curve intersect the long-run Phillips curve?**

a) At zero unemployment
b) At the natural rate of inflation
c) At the equilibrium interest rate
d) At the expected rate of inflation

131 **The circular flow of income is a model which describes all the transactions in a simple economy. Crutial acters in the circular flow of income are:**

a) Households and firms interacting through markets for goods and services and markets for factors of production
b) Households, firms, government and financial institutions interacting through markets for goods and services, markets for factors of production and foreign exchange market
c) Households, firms, government and financial institutions interacting by spending, taxes and savings
d) Households, firms, government and financial institutions, while total wages, rent, interest paid by firms in the markets for the factors of production

132 **National income could be described by the equation $Y \equiv C + I + G + NX$, where:**

a) C is consumption by households on goods and services; I is spending on capital equipment, inventories and structures, including household purchases of new housing; G is spending on goods and services by local and national governments; NX is net exports (exports-imports)

b) C is spending by households on goods; I is spending on capital equipment, inventories and structures; G is spending on goods and services by local and national governments; NX is net exports (exports-imports)

c) C is consumption by households on goods and services; I is spending on capital equipment, inventories and structures; G is spending on goods and services by national governments; NX is net exports (spending on domestically produced goods and services by foreigners minus spending on foreign goods by domestic residents)

d) Real GDP is equal nominal GDP

133 **Measure of the overall prices of the goods and services bought by a typical consumer is:**

a) GDP deflator

b) Consumer Prices Index (CPI)

c) Nominal inflation rate

d) GDP at constant prices

134 **Productivity is determinated by:**

a) The stock of equipment and structures that are used to produce goods and services - physical capital; knowledge and skills that workers acquire through education, training and experience – human capital; nature, land, rivers and mineral deposits - natural resources; understanding of the best ways to produce goods and services - technological knowledge

b) Capital, labour and land

c) Changes in the savings rates; an increase of population; capital stock; technological progress

d) Property rights, political stability and good governance

135 **The deviation of unemployment from its natural rate is called:**

a) natural rate of unemployment (NRU)

b) non-accelerating inflation rate of unemployment (NAIRU)

c) cyclical unemployment

d) effective demand

136 **Business cycle represents fluctuations in economic activity such as employment and production, in which:**

a) trough occurs when output, employment and other variables such as retail sales or manufacturing production begin to decline together, while peak refers to the time when these economic variables begin to rise

b) recession occurs when output, employment and other variables such as retail sales or manufacturing production begin to decline together, while depresion refers to the time when these economic variables begin to rise

c) depresion occurs when output, employment and other variables such as retail sales or manufacturing production begin to decline together, while recession refers to the time when these economic variables begin to rise

d) peak occurs when output, employment and other variables such as retail sales or manufacturing production begin to decline together, while trough refers to the time when these economic variables begin to rise

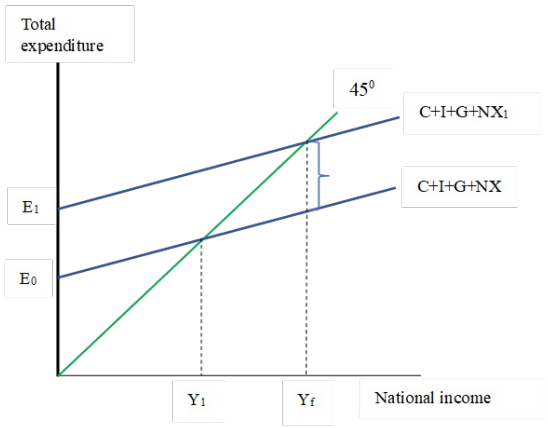
137 **Following figure shows:**

a) deflationary gap - there is insufficient demand to maintain full employment output - the government would need to shift the expenditure line

b) inflationary gap - the equilibrium is higher than full employment output – the economy does not have the capacity to meet demand

c) autonomous spending - this is the component of expenditure which does not depend on income/output – government spending being a key element of this expenditure

d) the additional shifts in aggregate supply that result when expansionary fiscal policy increases income and thereby increases consumer spending



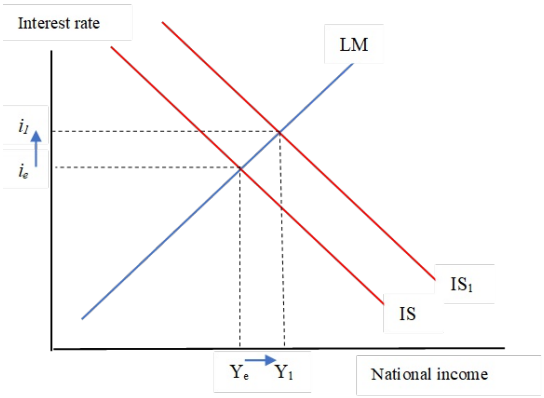
138 **IS curve shift to the right is result of:**

a) a rise in money supply resulting in a new equilibrium with a higher interest rate and level of national income

b) a rise in government spending resulting in a new equilibrium with a higher interest rate and level of national income

c) a rise in money supply resulting in a new equilibrium with a lowewr interest rate and level of national income

d) a rise in government spending resulting in a new equilibrium with a lower interest rate and level of national income



139 **Which are three key facts about economic fluctuations:**

a) economic fluctuations are irregular and unpredictable; most macroeconomic quantities fluctuate together; as output falls, unemployment rises
b) economic fluctuations are predictable; most macroeconomic variables fluctuate together; as output falls, employment rises
c) economic fluctuations are normal and predictable; most macroeconomic variables fluctuate separately; as employment rises, output falls
d) economic fluctuations are present in the short-run; most macroeconomic variables fluctuate together; as output falls, employment rises

140 **Interventionist supply-side policies are:**

a) policies designed to free up markets to improve resource allocation through more effective price signals
b) policies focused on government spending and taxes
c) based on actions available to a nation's central bank to achieve sustainable economic growth;
d) policies focused on improving the working of markets through investing in infrastructure, education, and research and development

141 **Gross domestic product (GDP) measures two things at once:**

a) the total income of everyone in the economy (national income) and the total expenditure on the economy's output of goods and services (national expenditure)
b) real and nominal GDP
c) gross domestic product and gross national product
d) the total savings of everyone in the economy and the total expenditure on the economy's output of goods and services (national expenditure)

142 **GDP calculated without taking into consideration the change in prices over time is called:**

a) GDP at current or market prices or real GDP
b) GDP at constant prices or nominal GDP
c) GDP at constant prices or real GDP
d) GDP at current or market prices or nominal GDP

143 **Important difference that can cause Consumer Price Index and GDP deflator to diverge is:**

a) Consumer Prices Index a measure of the overall prices of the goods and services bought by a typical consumer
b) GDP deflator a measure of the price level calculated as the ratio of nominal GDP to real GDP times 100, while CPI is based on prices
c) GDP deflator reflects the prices of all goods and services produced domestically, whereas the CPI reflects the prices of all goods and services bought by consumers
d) nominal GDP - the production of goods and services valued at current prices

144 **Business cycle represents fluctuations in economic activity such as employment and production, in which:**

a) recession could be characterized as a period of falling incomes and rising unemployment, which technically occurs after two successive quarters of negative growth; if such a contraction in growth continues it might be described as a depression

b) trough could be characterized as a period of falling incomes and rising unemployment, which technically occurs after two successive quarters of negative growth; if such a contraction in growth continues it might be described as a peak

c) depresion could be characterized as a period of falling incomes and rising unemployment, which technically occurs after two successive quarters of negative growth; if such a contraction in growth continues it might be described as a recession

d) expansion could be characterized as a period of falling incomes and rising unemployment, which technically occurs after two successive quarters of negative growth; if such a contraction in growth continues it might be described as a contraction

145 **When a variable is above trend when GDP is above trend, the variable is said to be:**

a) countercyclical (such as inflation, employment, nominal interest rate); if a variable is below trend when GDP is above trend, the variable is described as procyclical (such as unemployment)

b) procyclical (such as unemployment); if a variable is below trend when GDP is above trend, the variable is described as countercyclical (such as employment)

c) stochastic (such as inflation, employment, nominal interest rate); if a variable is below trend when GDP is above trend, the variable is described as deterministic (such as unemployment)

d) procyclical (such as inflation, employment, nominal interest rate); if a variable is below trend when GDP is above trend, the variable is described as countercyclical (such as unemployment)

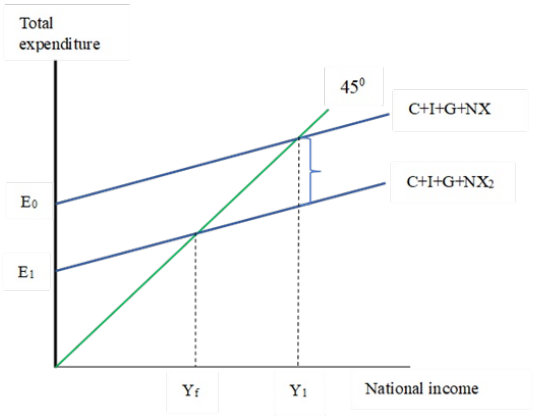
146 **Following figure shows:**

a) deflationary gap - there is insufficient demand to maintain full employment output - the government would need to shift the expenditure line

b) inflationary gap - the equilibrium is higher than full employment output – the economy does not have the capacity to meet demand

c) autonomous spending - this is the component of expenditure which does not depend on income/output – government spending being a key element of this expenditure

d) the additional shifts in aggregate supply that result when expansionary fiscal policy increases income and thereby increases consumer spending

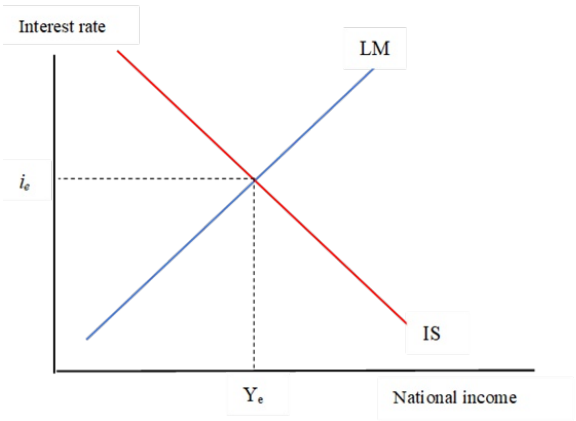


147 **Multiplier effect is:**

a) the additional shifts in aggregate demand that result when expansionary fiscal policy increases income and thereby increases consumer spending
b) the difference between full employment output and actual expenditure when actual expenditure is greater than full employment output
c) the difference between full employment output and expenditure when expenditure is less than full employment output
d) the additional shifts in aggregate supply that result when expansionary fiscal policy increases income and thereby increases consumer spending

148 **Following figure shows general equlibrium in:**

a) the money market where the demand for money equals the supply of money at a particular interest rate ie and level of national income Ye
b) the goods market where the demand for goods equals the supply of goods at a particular interest rate ie and level of national income Ye
c) aggregate supply and aggregate demand at a particular interest rate ie and level of national income Ye
d) both markets at the same time - the goods market and the money market at a particular interest rate ie and level of national income Ye



149 **Three key effects could explain the downwards slope of the AD curve:**

a) the net exports effect, th eprice level effect, and the demand effect
b) the supply effect, the wealth effect, and the demand effect
c) the wealth effect, the interest rate effect, and the exchange rate effect
d) the effect od monetary policy, the effect of fiscal policy, and the exchange rate effect

150 **Automatic stabilizers represent:**

a) the total sum of money received by a government - tax revenue and interest is equal to the amount it spends, including on any debt interest owing
b) changes in fiscal policy that stimulate AD when the economy goes into a recession, without policymakers having to take any action
c) Keynes' theory that the interest rate adjusts to bring money supply and money demand into balance
d) a period of falling output and rising prices

PRECALCULUS MATHEMATICS

Literature

Precalculus Version 3, Corrected Edition by Carl Stitz, Ph.D. Jeff Zeager, Ph.D.
Lakeland Community College Lorain County Community College July 4, 2013
https://www.stitz-zeager.com/szprecalculus07042013.pdf

Questions

Please choose correct answer by circling the letter in front of the statement you find best suits definitions provided.

1 **Find all of the points on the line y = 2x + 1 which are 4 units from the point (-1, 3)**

a) (−1, −1) and (11/5, 27/

b) (1, 1) and (11/5, 27/

c) (−1, −1) and (-11/5, -27/5)

2 **An on-demand publisher charges $22.50 to print a 600 page book and $15.50 to print a 400 page book. Find a linear function which models the cost of a book C as a function of the number of pages p.**

a) a)C(p) = 0.35p + 15

b) b) C(p) = 0.035p + 1.5

c) c) C(p) = 3.5p + 1.5

3 **A local pizza store offers medium pizzas delivered for $6.00 per pizza plus a $1.50 delivery charge per order. On weekends, the store runs a 'game day' special: if six or more medium pizzas are ordered, they are $5.50 each with no delivery charge. Write a piecewise-defined linear function which calculates the cost C (in dollars) of p medium pizzas delivered during a weekend.**

a) $\mathrm{C(p)} = \begin{cases} 6p + 1.5, & if\ p < 6 \\ 5.5p + 1.5\ if\ p \geq 6 \end{cases}$

b) $\mathrm{C(p)} = \begin{cases} 6p, & if\ p < 6 \\ 5.5p + 1.5\ if\ p \geq 6 \end{cases}$

c) $\mathrm{C(p)} = \begin{cases} 6p + 1.5, & if\ p < 6 \\ 5.5p\ if\ p \geq 6 \end{cases}$

4 **Find the line parallel to the given line which passes through the given point:**
y = −6x + 5, P(3, 2)

a) y = -6x + 20

b) y = -6x + 8

c) y = -6x + 1

5 **Find the line parallel to the given line which passes through the given point:**

$\mathrm{y} = \frac{2}{3}\mathrm{x} - 7, \mathrm{P}(6, 0)$

a) $\mathrm{y} = \frac{2}{3}\mathrm{x} + 7$ b)

b) $\mathrm{y} = \frac{2}{3}\mathrm{x} - 4$ c)

c) $\mathrm{y} = \frac{2}{3}\mathrm{x}$

6 **Find the line perpendicular to the given line which passes through the given point:**
$y = \frac{4-x}{3}$, $P(1, -1)$

a) y = 3x + 1
b) y = -3x – 2
c) y = 3x – 4

7 **Find the line perpendicular to the given line which passes through the given point:**
y = 6, P(3, −2)

a) $y = 3x + 1$
b) $y = -3x - 2$
c) $y = 3x - 4$

8 **Solve the equation: 4 − |x| = 2x + 1**

a) No solution
b) x = 0
c) x = 1

9 **Solve the equation: |x − 4| = x – 5**

a) No solution
b) x = 0
c) x = 1

10 **The cost, in cents, to produce x cups of lemonade at Junior's Lemonade Stand is C(x) = 18x + 240, x ≥ 0 and the price-demand function, in cents per cup, is p(x) = 90 − 3x, 0 ≤ x ≤ 30. Find the profit function and the maximum profit.**

a) P(x) = −3x2 + 72x − 240, for 0 ≤ x ≤ 30, Pmax = P(x = 12) = 192¢ = $1.92.
b) P(x) = −3x2 + 60x − 120, for 0 ≤ x ≤ 30, Pmax = P(x = 10) = 180¢ = $1.80.
c) P(x) = −3x2 + 84x − 240, for 0 ≤ x ≤ 30, Pmax = P(x = 14) = 348¢ = $3.48.

11 **It has been determined that the cost in dollars of baking x cookies is C(x) = 0.1x + 25 and that the demand function for cookies is p = 10 − .01x. How many cookies should they bake in order to maximize their profit?**

a) 490
b) 495
c) 500

12 **What is the largest rectangular area one can enclose with 14 meters of string?**

a) 22.25 m^2
b) 10.25 m^2
c) 12.25 m^2

13 **Jason participates in the Highland Games. In one event, the hammer throw, the height h in feet of the hammer above the ground t seconds after Jason lets it go is modeled by $h(t) = -16t^2 + 22.08t + 6$. What is the hammer's total time in the air? Round your answer to two decimal places.**

a) 1.61 sec
b) 2.72 sec
c) 3.02 sec

14 **Solve the equation:**
$\frac{2x-1}{x-1} = \frac{7x-1}{2x+2}$

a) x = -3, 3

b) x = 1/3, 3

c) x = -1/3, 3

15 **Solve the quadratic equation for the indicated variable: $y^2 - 4y = x^2 - 4$ for x.**

a) x = ±(y+2)

b) x = ±(y-2)

c) x = ±(y+1)

16 **Solve the quadratic equation for the indicated variable: y2 − 4y = x2 − 4 for y.**

a) y = 2±x

b) y = 2±2x

c) y = ±(x+1)

17 **Solve the quadratic equation for the indicated variable: $x^2 - mx = 1$ for x**

a) $x = \frac{m \pm \sqrt{m^2-4}}{2}$

b) $x = \frac{m \pm \sqrt{m^2+4}}{2}$

c) $x = \frac{m \pm \sqrt{m^2+4m}}{2}$

18 **Solve the inequality. Write your answer using interval notation. $x|x + 5| \geq -6$**

a) [-2, ∞)

b) [−6, −3]

c) [−6, −3] U [-2, ∞)

19 **Solve the inequality. Write your answer using interval notation. $x^2 \geq |x|$**

a) (−∞, −1] U {0} U [1, ∞)

b) [0, ∞)

c) (−∞, 0]

20 **Solve the inequality. Write your answer using interval notation. $9x^2 + 16 \geq 24x$**

a) (−∞, ∞)

b) (-∞, -6)

c) (1, ∞)

21 **Write and solve an inequality involving absolute values for the given statement: Find all real numbers x so that 3x is within 2 units of −1.**

a) [−1, 1/3]

b) (-∞, −1] U [1/3, ∞)

c) [−1, 2/3]

22 **Use polynomial long division to find the remainder: $(2x^3 - x + 1) \div (x^2 + x + 1)$**

a) r = -x + 3

b) r = x + 2

c) r = x – 1

23 **Use polynomial long division to find the remainder: $(-x^5 + 7x^3 - x) \div (x^3 - x^2 + 1)$**

a) r = 6x2 + 2x + 1

b) r = 7x2 – 6

c) r = 4x2 + 1

24 **You are given a polynomial and one of its zeros.**

Find the rest of the real zeros. $x^3 - 24x^2 + 192x - 512$, c = 8

a) c = 8

b) c = -8

c) none

25 **You are given a polynomial and one of its zeros.**

Find the rest of the real zeros. $3x^3 + 4x^2 - x - 2$, c = 2/3

a) c = -1

b) c = 1, -1

c) none

26 **Create a polynomial p which has the desired characteristics:**

The zeros of p are c = 1 and c = 3. c = 3 is a zero of multiplicity 2.

The leading term of p(x) is $-5x^3$.

a) $p(x) = 5(x - 1)(x - 3)^2$

b) $p(x) = -5(x - 1)(x - 3)^2$

c) $p(x) = -5(x - 1)(x - 3)$

27 **Find a quadratic polynomial with integer coefficients which has**

$x = \frac{3}{5} \pm \frac{\sqrt{29}}{5}$ **as its real zeros.**

a) $p(x) = 5x^2 - 6x + 4$

b) $p(x) = x^2 - 5x - 3$

c) $p(x) = 5x^2 - 6x - 4$

28 **Find the real solutions of the polynomial equation: $14x^2 + 5 = 3x^4$**

a) $x = \pm\sqrt{5}$

b) $x = \pm 5$

c) $x = \pm\frac{5}{4}$

29 **Find the real solutions of the polynomial equation: $9x^2 + 5x^3 = 6x^4$**

a) $x = \frac{5 \pm \sqrt{241}}{12}$

b) $x = 0, \frac{5 \pm \sqrt{141}}{12}$

c) $x = 0, \frac{5 \pm \sqrt{241}}{12}$

30 **Solve the polynomial inequality:** $\frac{x^3+20x}{8} \geq x^2 + 2$

a) [4, ∞)

b) [2, ∞)

c) {2} U [4, ∞)

31 **Solve the polynomial inequality: $2x^4 > 5x^2 + 3$**

a) (√3, ∞)

b) (−∞, −√3) U (√3, ∞)

c) (−√3, ∞)

32 **Use the given complex numbers z and w: z = 3 − 5i, w = 2 + 7i to find $\frac{z}{w}$ and simplify the following. Write your answers in the form a + bi.**

a) $-\frac{29}{53} - \frac{31}{53}i$

b) $-\frac{19}{53} - \frac{31}{53}i$

c) $\frac{29}{53} - \frac{31}{53}i$

33 **Use the given complex numbers z and w: z = 1 − i√3 3, w = −1 − i√3 to find $\frac{z}{w}$ and simplify the following. Write your answers in the form a + bi.**

a) $-\frac{1}{2} + \frac{\sqrt{3}}{2}i$

b) $\frac{1}{2} - \frac{\sqrt{3}}{2}i$

c) $\frac{1}{2} + \frac{\sqrt{3}}{2}i$

34 **Use the given complex numbers z and w: z = 4i, w = 2 – 2i to find $\frac{z}{w}$ and simplify the following. Write your answers in the form a + bi.**

a) -1 + i

b) -1 – i

c) 1 – i

35 **Use the given complex numbers z and w: z = √2 - √2i, w = √2 + √2i to find $\frac{z}{w}$ and simplify the following. Write your answers in the form a + bi.**

a) -1

b) i

c) –i

36 **Simplify: $i^{117} + i^{304}$**

a) 1 – i

b) 1 + i

c) -1 + i

37 **Simplify: $(1 + i)^4 + (1 – i)^4$**

a) 8

b) 0

c) 1

38 **Solve the rational inequality:** $\frac{x^3-2x+1}{x-1} \geq \frac{1}{2}x - 1$

a) (-∞, -1/2] U [0, 1) U (1, ∞)

b) (-∞, 1) U (1, ∞)

c) (-∞, 1/2] U (1, ∞)

39 **Solve the rational inequality:** $\frac{x}{x^2+x-12} \geq 0$

a) (-4, ∞)

b) (-4, 0] U (3, ∞)

c) (-4, 0] U [3, ∞)

40 **Find the domain of the function**

$$f(x) = \sqrt{\frac{-x^3+4x}{x^2-9}}$$

a) (-∞, -3) U (-2, 0) U (2, 3)

b) (-∞, 3)

c) (-∞, -3) U (-2, 3)

41 **Solve the rational inequality:**

$$\frac{-x^3+4x}{x^2-9} \geq 0$$

a) (-∞, -3) U (-2, 0) U (2, 3)
b) (-∞, 3)
c) (-∞, -3) U (-2, 3)

42 **Solve the rational inequality:**

$$\frac{2x+17}{x+1} > \mathrm{x} + 5$$

a) (-∞, -6) U (-1, 2) U (6, ∞)
b) (-∞, -6) U (1, 2)
c) (-∞, -6) U (-1, 2)

43 **Carl and Mike start a 3 mile race at the same time. If Mike ran the race at 6 miles per hour and finishes the race 10 minutes before Carl, how fast does Carl run?**

a) 5 miles per hour
b) 4.5 miles per hour
c) 4 miles per hour

44 **Find two consecutive odd natural numbers whose product equals 1155**

45 **Donnie observes that the wind is blowing at 6 miles per hour. A swallow nesting near Donnie's house flies three quarters of a mile down the road (in the direction of the wind), turns around, and returns exactly 4 minutes later. What is the airspeed of the unladen swallow? (Here, `airspeed' is the speed that the swallow can fly in still air.)**

a) 28 miles per hour
b) 20 miles per hour
c) 24 miles per hour

46 **A right cylindrical drum is to hold 7.35 cubic feet of liquid. Find the dimensions (radius of the base and height) of the drum which would minimize the surface area. Round your answers to two decimal places.**

a) r ≈ 1.05 ft, h≈2.12 ft
b) r ≈ 1 ft, h≈2.2 ft
c) r ≈ 1.15 ft, h≈2.01 ft

47 **Compare numbers**

$$\mathrm{A} = 2 - \sqrt{3} \text{ and } \mathrm{B} = \frac{1}{2+\sqrt{3}}$$

a) A = B
b) A > B
c) A < B

48 **Compare numbers**

$$\mathrm{A} = \frac{14}{3^{10}5^{11}} \text{ and } \mathrm{B} = \frac{12}{3^{11}5^{10}}$$

a) A = B
b) A > B
c) A < B

49 **Find the inverse function for**

$f(x) = \frac{2x-1}{3x+4}$

a) $f^{-1}(x) = \frac{3x-4}{2x+1}$

b) $f^{-1}(x) = \frac{4x+1}{2-3x}$

c) $f^{-1}(x) = \frac{2x+1}{3x-4}$

50 **Find the inverse function for**

$f(x) = \frac{-3x-2}{x+3}$

a) $f^{-1}(x) = \frac{-3x-1}{3x-4}$

b) $f^{-1}(x) = \frac{2x-1}{3x+4}$

c) $f^{-1}(x) = \frac{-3x-2}{x+3}$

51 **Find the domain of the function**

$f(x) = \sqrt{2 - \sqrt[4]{x+3}}$

a) [-3, 3]

b) [-3, 13]

c) [0, 13]

52 **Solve the inequality:**

$\sqrt[3]{x^3 + 3x^2 - 6x - 8} > x + 1$

a) (-∞, -1)

b) (-∞, 1)

c) (-∞, -1) U (1, ∞)

53 **Solve the inequality:**

$2 - \sqrt[4]{x+3} \geq 0$

a) (-∞, -1)

b) (-∞, 1)

c) (-∞, -1) U (1, ∞)

54 **Solve the inequality:**

$g(x) = ln(\frac{x}{x-1})$

a) (0, 1)

b) (-∞, 0) U (1, ∞)

c) (1, ∞)

55 **Evaluate the expression:**

$\log_{36}(\sqrt[4]{36})$

a) 36

b) 1

c) 0.25

56 **Evaluate the expression:**

$$\log_2(\log_2(\log_3(81)))$$

a) 1
b) 2
c) 0

57 **Solve the equation: $\log_3(1 + \log_2(1 + 3\log_2(x))) = 1$**

a) x = 0
b) x = 1
c) x = 2

58 **Solve the equation: $49^x \cdot 7^{x+2} = 1$**

a) x = 1
b) x = -2/3
c) x = -3

59 **Solve the equation: ln(x) + ln(x + 3) = ln(20 – 5x)**

a) x = 1
b) x = 2
c) x = 3

60 **Solve the equation $\log_3(25 - x^2) = 2$**

a) X = ±3
b) X = ±4
c) X = ±2

61 **Evaluate the expression:**

$$\log_5(3^{\log_3(5)})$$

a) -1
b) 0
c) 1

62 **Find the domain of the function:**

$$g(x) = ln(\frac{x^2+9x+18}{4x-20})$$

a) (−6, -3) U (5, ∞)
b) (−6, ∞)
c) (-3, ∞)

63 **Use the properties of logarithms to write the expression as a single logarithm:**
$\log_2(x) + \log_{1/2}(x - 1)$

a) $\log_2(\frac{x}{x-1})$
b) $\log_2(\frac{x-1}{x})$
c) $\log_2(1 - \frac{1}{x})$

64 **Use the properties of logarithms to write the expression as a single logarithm:**
$\log_7(x) + \log_7(x - 3) - 2$

a) $\log_7(\frac{x-1}{x})$
b) $\log_7(\frac{x(x-3)}{49})$
c) $\log_7(\frac{49}{x(x-3)})$

65 **Solve the following inequality:**

$$2^{x^2-3x} - 16 \geq 0$$

a) [4, ∞)

b) (−∞, −1]

c) (−∞, −1] U [4, ∞)

66 **Find the inverse function for**

$$g(x) = \frac{5e^x}{e^x+1}$$

a) $g^{-1}(x) = \ln\left(\frac{5x}{x+1}\right)$

b) $g^{-1}(x) = \ln\left(\frac{x}{5-x}\right)$

c) $g^{-1}(x) = \ln\left(\frac{x+1}{5x}\right)$

67 **Find the domain of the function:**

$$9 \cdot 3^{7x} = \left(\frac{1}{9}\right)^{2x}$$

a) x = -2/11

b) x = -2/9

c) x = -2/3

68 **Solve the equation analytically:**

$5^{x+1} - 5^x = 20$

a) x = 0

b) x = 1

c) x = 2

69 **Solve the equation analytically:**

$e^{2x} = e^x + 6$

a) x = ln(2)

b) x = ln(3)

c) x = ln(5)

70 **Solve the equation analytically:**

$e^x + 15e^{-x} = 8$

a) x = ln(2), x = ln(3)

b) x = ln(3), x = ln(5)

c) x = ln(5)

71 **Solve the inequality analytically:**

$$2^{x^3-x} < 1$$

a) (−∞, −1) U (0, ∞)

b) (−∞, 1)

c) (−∞, −1) U (0, 1)

72 **Solve the inequality analytically:**

$e^{-x} - xe^{-x} \geq 0$

a) (−∞, 1) U (0, ∞)

b) (−∞, 1)

c) (−∞, 0)

73 **Solve the equation analytically:**

$\log_3(x - 4) + \log_3(x + 4) = 2$

a) x = 5

b) x = 10

c) x = 15

74 **Solve the equation analytically:**

$2\log_7(x) = \log_7(2) + \log_7(x + 12)$

a) x = 5

b) x = 6

c) x = 7

75 **Solve the equation analytically:**

$\ln(x^2) = (\ln(x))^2$

a) x = 1, x = e

b) x = 1, $x = e^{-1}$

c) x = 1, $x = e^2$

76 **Solve ln(3 − y) − ln(y) = 2x + ln(5) for y.**

a) $y = \frac{5}{5e^{2x}+1}$

b) $y = \frac{3}{5e^{2x}+1}$

c) $y = \frac{4}{5e^{2x}+1}$

77 **Solve the inequality analytically: xln(x) – x > 0**

a) (e, ∞)

b) (1/e, ∞)

c) (0, ∞)

78 **Find the center of the ellipse: $9x^2 + 25y^2 - 54x - 50y - 119 = 0$**

a) C(3, 1)

b) C(-3, 1)

c) C(1, 3)

79 **Find the standard form of the equation of the ellipse which has the given properties: Vertices (3, 2), (13, 2); Endpoints of the Minor Axis (8, 4), (8, 0)**

a) $\frac{(x-8)^2}{25} + \frac{(y-2)^2}{16} = 1$

b) $\frac{(x-8)^2}{25} + \frac{(y-2)^2}{4} = 1$

c) $\frac{(x-4)^2}{25} + \frac{(y-2)^2}{4} = 1$

80 **Find the equation of the hyperbola with asymptotes y = ±2x and vertices (±5, 0).**

a) $\frac{x^2}{25} - \frac{y^2}{100} = 1$

b) $\frac{y^2}{25} - \frac{x^2}{100} = 1$

c) $\frac{x^2}{16} - \frac{y^2}{100} = 1$

81 **Solve the given system using substitution and/or elimination:**

$$\frac{2}{3}x - \frac{1}{5}y = 3$$
$$\frac{1}{2}x + \frac{3}{4}y = 1$$

a) $(\frac{49}{15}, -\frac{25}{18})$

b) $(\frac{49}{12}, -\frac{25}{18})$

c) $(\frac{49}{12}, -\frac{5}{18})$

82 **Solve the given system using substitution and/or elimination:**
x + y = 8000
0.03x + 0.05y = 250
a) (6000, 2000)
b) (7000, 1000)
c) (7500, 500)

83 **Mavis mixes two different types of coffee beans to produce a house blend. The first type costs $3 per kilo and the second costs $8 per kilo. How much of each type does Mavis use to make 50 kilos of a blend which costs $6 per kilo?**
a) 20 kg of first and 30 kg of second
b) 10 kg of first and 40 kg of second
c) 30 kg of first and 20 kg of second

84 **Solve the given system using substitution and/or elimination:**
x + y = 3
y + z = 5
x + z = 6
a) (1, 2, 4)
b) (2, 1, 4)
c) (1, 2, 5)

85 **A 10% salt solution is to be mixed with pure water to produce 75 gallons of a 3% salt solution. How much of each are needed?**
a) 25.0 gallons of the 10% solution and 50.0 gallons of pure water
b) 22.5 gallons of the 10% solution and 52.5 gallons of pure water
c) 30.0 gallons of the 10% solution and 45.0 gallons of pure water

86 **A local buffet charges $7.50 per person for the basic buffet and $9.25 for the deluxe buffet (which includes crab legs.) If 27 diners went out to eat and the total bill was $227.00, how many chose the basic buffet and how many chose the deluxe buffet?**
a) 13 chose the basic buffet and 14 chose the deluxe buffet
b) 13 chose the basic buffet and 14 chose the deluxe buffet
c) 13 chose the basic buffet and 14 chose the deluxe buffet

87 **Solve the given system of nonlinear equations:**
$x^2 - y = 4$
$x^2 + y^2 = 4$
a) (±2, 0), (± √3, −1)
b) (2, 0), (± √3, −1)
c) (±2, 0), (√3, −1)

88 **Solve the given system of nonlinear equations:**
$$\sqrt{x+1} - y = 0$$
$$x^2 + 4y^2 = 4$$
a) (0, -1)
b) (0, 1)
c) (-1, 0)

89 **Solve the given system of nonlinear equations:**

$$4\ln(x) + 3y^2 = 1$$
$$3\ln(x) + 2y^2 = -1$$

a) $(e^{-5}, \pm\sqrt{7})$

b) $(e^{-5}, \pm\sqrt{7})$

c) $(e^{-5}, \pm\sqrt{7})$

90 **Find the sum 1 + 3 + 9 + . . . + 2187**

a) 3280

b) 2,393,672

c) 34,455

91 **The first four elements of an arithmetic sequence are: 5, 9, 13, 17,... How many elements need to be added to get 10,877?**

a) 73

b) 68

c) 81

92 **Find the sum 3– 3/2 + 3/4 – 3/8 +– · · ·+ 3/256**

a) $\frac{394}{256}$

b) $\frac{513}{256}$

c) $\frac{441}{256}$

93 **Express repeating decimal as a fraction of integers:** $0.\overline{13}$

94 **Express repeating decimal as a fraction of integers:** $-5.86\overline{7}$

95 **Use the Binomial Theorem to find the indicated term: the constant term in the expansion** $\left(x + \frac{1}{x}\right)^8$

a) 70

b) 56

c) 112

96 **Use the Binomial Theorem to find the indicated term: the term containing x^{-7} in the expansion $(2x - x^{-3})^5$**

a) $20x^{-7}$

b) $40x^{-7}$

c) $60x^{-7}$

97 **Solve the equation for t:**

$$\tan(t) = -\frac{\sqrt{3}}{3}$$

a) $t = \frac{\pi}{2} + k\pi$ for any integer k

b) $t = \frac{2\pi}{3} + k\pi$ for any integer k

c) $t = \frac{5\pi}{6} + k\pi$ for any integer k

98 **If sin(θ) = x/2 for – π/2 < θ < π/2 , find an expression for cos(2θ) in terms of x.**

a) $1 - \frac{x^2}{2}$

b) $\frac{x^2}{2}$

c) $\frac{x^2}{2} - 1$

99 **Use the given information about θ to find the exact value of cos(2θ):**
cos(θ) = 12/13 where 3π/2 < θ < 2π

a) $\cos(2\ ) = -\frac{119}{169}$

b) $\cos(2\ ) = \frac{119}{169}$

c) $\cos(2\ ) = \frac{49}{169}$

100 **Find the domain of the given function**

$f(x) = \arccos(\frac{1}{x^2-4}))$

a) $(-\infty, \infty)$

b) $[-\sqrt{3}, \sqrt{3}]$

c) $(-\infty, -\sqrt{5}]$ $[-\sqrt{3}, \sqrt{3}]$ $[\sqrt{5},$

101 **Find the domain of the given function**

$f(x) = \operatorname{arccot}(\sqrt{2x-1})$

a) $(-\infty, \infty)$

b) $(1/2, \infty)$

c) $(-\infty, -1/2)$

102 **Solve the equation, giving the exact solutions which lie in [0, 2π): 3cos(2x) + cos(x) + 2 = 0**

a) x = 2π/3 , 4π/3 , arccos(1/3), 2π – arccos(1/3)
b) x = π/3 , 2π/3 , arccos(1/3), 2π – arccos(1/3)
c) x = π/3 , 4π/3 , arccos(1/3), 2π – arccos(1/3)

103 **Solve the equation, giving the exact solutions which lie in [0, 2π): cos(2x) = 5sin(x) – 2**

a) x = 4π/6 , 5π/6
b) x = π/6 , 5π/6
c) x = 5π/6 , 7π/6

104 **Solve the equation, giving the exact solutions which lie in [0, 2π): $\tan^2(x) = 1 - \sec(x)$**

a) x = 0, π/3 , 2π/3
b) x = 0, 5π/3 , 7π/3
c) x = 0, 2π/3 , 4π/3

105 **Solve the equation, giving the exact solutions which lie in [0, 2π): cos(2x) + 6sin(x) – 5 = 0**

a) x = 5π/3 , 7π/3
b) x = 11π/3 , 7π/3
c) x = 2π/3 , 7π/3

106 **Solve the inequality. Express the exact answer in interval notation, restricting your attention to 0 ≤ x ≤ 2π: . cot2(x) ≥ 1/3**

a) (0, π/3] U [2π/3 ,π) U (π, 4π/3] U [5π/3 , 2π)
b) (0, π/3) U (2π/3 ,π) U (π, 4π/3] U [5π/3 , 2π)
c) (0, π/6] U [π/3 ,π) U (π, 4π/3] U [5π/3 , 2π)

107 **Evaluate the trigonometric expression: $(\sin\alpha\cos\beta - \cos\alpha\sin\beta)^2 + (\cos\alpha\cos\beta + \sin\alpha\sin\beta)^2$**

a) 0
b) 1
c) $\frac{\sqrt{2}}{2}$

108 **Evaluate the trigonometric expression:**

$\frac{1-\tan^2(}{1+\tan^2(}$

a) sin(x)

b) cos(x)

c) tan(x)

109 **Carl spies a potential bird nest at a bearing of N10◦E and radios Jeff, who is at a bearing of N50◦E from Carl's position. From Jeff's position, the nest is at a bearing of S70◦W. If Jeff and Carl are 500 feet apart, how far is Jeff from the Sasquatch nest? Round your answer to the nearest foot.**

a) 251 ft

b) 371 ft

c) 431 ft

111 **A geologist wants to measure the diameter of a crater. From her camp, it is 4 miles to the northern-most point of the crater and 2 miles to the southern-most point. If the angle between the two lines of sight is 117◦, what is the diameter of the crater? Round your answer to the nearest hundredth of a mile.**

a) 4,22 miles

b) 5,22 miles

c) 6,22 miles

112 **Find the area of the triangle with the sides a = 300, b = 302, c = 48**

a) A ≈ 7317.23

b) A ≈ 7238.91

c) A ≈ 7194.75

113 **Find the area of the triangle with the sides a = 7, b = 10, c = 13**

a) A ≈ 34.64

b) A ≈ 33.17

c) A ≈ 35.74

114 **Solve the equation: $\log_4(x^2 - 2x) = \log_4(5x - 12)$**

a) x = 3, 4

b) x = 4, 5

c) x = 5, 6

115 **Solve the equation: log(6x) – log(4 – x) = log(3)**

a) x = 2/3

b) x = 4/3

c) x = 2

116 **Solve the equation: log2(x + 1) – log2(2 – x) = 3**

a) x = 4/3

b) x = 5/3

c) x = 2/3

117 **Let x and y be positive constants. Which of the following is equivalent to 2ln(x) – 3ln(y)?**

a) $\ln(\frac{x^2}{y^3})$

b) $\ln(x^2y^3)$

c) ln(2x – 3y)

118 **Solve the following system of equations:**

$y = -x2 + 5x + 16$

$y = 7x - 8$

a) (4, 20) and (-6, -50)

b) (-4, -20) and (-6, -50)

c) (4, 20) and (6, 50)

119 **Solve the following system of equations:**

$x^2 + 0.25y^2 = 1$

$y = 4 - 4x$

a) (1, 0) and (0.6, 1.6)

b) (-4, -20) and (-6, -50)

c) (4, 20) and (6, 50)

120 **Solve the following system of equations:**

$x^2 + y^2 = 9$

$y = 1 + 0.2x^2$

a) (√5,2),(-√5,-2)

b) (√5,2),(-√5,2)

c) (-√5,-2),(-√5,2)

121 **Solve the following system of equations:**

$$xy = -2$$
$$x^2 + \frac{y^2}{25} = 1$$

a) $\left(\frac{4}{\sqrt{5}}, -\sqrt{5}/2\right), \left(-\frac{4}{\sqrt{5}}, \sqrt{5}/2\right), \left(\frac{1}{\sqrt{5}}, -2\right.$

b) $\left(\frac{1}{\sqrt{5}}, -2\sqrt{5}\right), \left(-\frac{1}{\sqrt{5}}, 2\sqrt{5}\right)$

c) $\left(\frac{2}{\sqrt{5}}, -\sqrt{5}\right), \left(-\frac{2}{\sqrt{5}}, \sqrt{5}\right), \left(\frac{1}{\sqrt{5}}, -2\sqrt{5}\right),$

122 **Solve the following equation: $6 \cdot 4^x - 13 \cdot 6^x + 6 \cdot 9^x = 0$**

a) x = 1, -1

b) x = 2, -2

c) x = 3, -3

123 **Solve the following equation:**

$$\left(\frac{1}{9}\right)^x - \frac{6}{3^x} + 8 = 0$$

a) x = -log3(2), -log3(4)

b) x = -1, -2

c) x = log3(2)

124 **Solve the following equation: $4x - 2^x - 12 = 0$**

a) x = 1, 2

b) x = 2

c) x = 1

125 **Solve the following equation: $e^{2x} + e^x = 6$**

a) x = ln(3)

b) x = ln(2)

c) x = ln(4)

126 **Solve the following equation: $9^x-3^{(x+1)}=54$**

a) x = 1

b) x = 2

c) x = 3

127 **Solve the inequality:** $5^{x^2+3} \leq 5^{4x}$

a) [1, 3]

b) (-∞, 1] U [3, ∞)

c) [2, 9]

128 **Solve the inequality:**

$3^{\frac{x-3}{3x-2}} \leq 3$

a) (-∞, 1] U [3, ∞)

b) (-∞, -1/2] U (2/3, ∞)

c) [3, ∞)

129 **Solve the inequality: $2^{(x+1)}+2^{(2-x)}>9$**

a) (-1, 2)

b) (-∞, 0) U (2, ∞)

c) (-∞, -1) U (2, ∞)

130 **Determine the intervals, in which the inequality is true:**

$\frac{3x-1}{2x-1} < -4$

a) $(\frac{5}{11}, ½)$

b) $(\frac{1}{9}, \infty)$

c) $(-\infty, 1/12)$

131 **Determine the intervals, in which the inequality is true:**

$\frac{x^2-2x+3}{x+1} \leq 1$

a) $(-\infty, -1)\ \mathrm{U}\ [1, 2]$

b) $[1, 2]$

c) $(-\infty, -1)$

132 **Determine the intervals, in which the inequality is true**

$\frac{2}{x-2} + \frac{3}{x-3} \leq 0$

a) $(-\infty, 2)$

b) $(-\infty, -1)\ \mathrm{U}\ [1, 2]$

c) $(-\infty, 2)\ \mathrm{U}\ [12/5, 3)$

133 **Find the volume and surface area of a cube, if the area of its one face is 40 cm².**

a) V = 80√10 cm³, A = 240 cm²

b) V = 800 cm³, A = 160 cm²

c) V = 800 cm³, A = 240 cm²

134 **Find the surface area of a triangular prism with a right-angled triangle base, if length of the prism base legs are 6 cm and 8 cm and height of a prism is 24 cm.**

a) A = 604 cm2

b) A = 624 cm2

c) 614 cm2

135 **Find the volume of a pillar in a shape of a prism with a rhombus base, which diagonals are d1 = 102 cm, d2 = 64 cm. Height of a pillar is 1.5 m.**

a) V = 3.43 m^3
b) V = 342.72 dm^3
c) V = 34,272 cm^3

136 **Swimming pool with a depth of two meters has the shape of a prism with an isosceles trapezoid bottom. Dimensions of the trapezoid's bases are 10 m and 18 m and legs are 7 m long. During a spring cleaning we have to paint bottom and side walls of the pool. How many m^2 do we need to paint? Round your answer to the nearest hundredth of a m^2.**

a) A ≈ 164.32 m^2
b) A ≈ 166.25 m^2
c) A ≈ 163.28 m^2

137 **Cylindrical vase is 28 cm high. Its internal diameter is d = 1.1 dm. How many liters of water will fill up a vase, if thickness of its bottom is 1.5 cm? Round your answer to a tenth of the liter.**

a) V ≈ 2.5 l
b) V ≈ 2.4 l
c) V ≈ 2.6 l

138 **A cylindrical container with a diameter of 1.8 m contains 2,000 l of water. To what height reaches the water?**

a) H ≈ 78.5 cm
b) H ≈ 77.5 cm
c) H ≈ 79.5 cm

139 **Road roller has a diameter of 1.2 m and a width of 180 cm. How many m2 of road it will flatten if it turns 35 times?**

a) A ≈ 237.5 m^2
b) A ≈ 266.25 m^2
c) A ≈ 263.28 m^2

140 **What is the weight of 1,000 m of copper wire with a diameter of 5 mm, if density of copper is ρ = 8.8 g/cm3 ?**

a) Between 150 kg and 160 kg
b) Between 160 kg and 170 kg
c) Between 170 kg and 180 kg

141 **Find the volume of a square pyramid where the base edge is 45 cm long and the height of the pyramid is 7 cm.**

a) V = 1441 cm^3
b) V 2344 cm^3
c) V = 4725 cm^3

142 **A pyramid has a rectangular base with dimensions of a = 6 cm, b = 8 cm. The side edges are all of the same length s = 12.5 cm. Find the surface area of the pyramid.**

a) A > 220 cm^2
b) 200 cm^2 < A < 220 cm^2
c) A < 200 cm^2

143 **A cube with an edge length of 12 dm has inscribed pyramid with the apex at the center of the upper face of the cube. Determine the volume of the pyramid.**

a) V = 144 dm^3
b) V = 484 dm^3
c) V = 576 dm^3

144 **How many liters of air is under the roof of the castle tower, which has a shape of a regular hexagonal pyramid with a base edge length of 3.6 m and a height of 2.5 m, if the supporting pillars occupy about 7% of the space under the roof ?**

a) Between 24,000 and 25,000 liters
b) Between 25,000 and 26,000 liters
c) Between 26,000 and 27,000 liters

145 **A cone and a cylinder have the same volume of 180 cm3 and the same height of h = 15 cm. Which of these two solids has a larger surface area?**

a) A(Cylinder) > A(Cone)
b) A(Cylinder) < A(Cone)

146 **Find the surface area of a cone with a base radius r = 2.3 dm if the height of cone is h = 46 mm. Round your answer to the hundredth of a decimeter.**

a) A ≈ 21.12 dm^2
b) A ≈ 31.72 dm^2
c) A ≈ 33.56 dm^2

147 **We have to paint without base the outside of forty same traffic cones with a base diameter of d = 36 cm and a height of h = 46 cm. How many euros we will pay for the color, if we need 500 cm3 of a paint color to paint 1 m2 and 1 liter of the color costs 8 €? Round your answer to the nearest cent.**

a) 74.69 euros
b) 36.69 euros
c) 44.69 euros

148 **Michael modeled from play dough a 15 cm high pyramid with a rectangular base with dimensions of a = 12 cm and b = 8 cm. Jane remodeled Michael's pyramid into a cone with a base diameter of d = 10 cm. What was the height of Jane's cone? Round your answer on two decimals.**

a) H ≈ 21.12 cm
b) H ≈ 18.33 cm
c) H ≈ 19.57 cm

149 **Simplify the product and quotient of algebraic fractions and determine the conditions of solvability :** $\frac{1}{x^2-x} : \frac{1}{x^2-x^3}$

a) x, x ≠0,1,-1
b) -x, x ≠0,1,-1
c) -x, x ≠0,1

150 **Simplify the product and quotient of algebraic fractions and determine the conditions of solvability :** $\left(\frac{1}{a+1} - \frac{2a}{a^2-1}\right)\left(\frac{1}{a} - 1\right)$

a) 1/a, a ≠0,1,-1
b) -1/a, a ≠0,1,-1
c) a, a ≠0,1,-1

INFORMATION TECHNOLOGY & SYSTEMS

Literature

Reynolds, G., & Stair, R. (2021). Principles of Information Systems. Boston: Cengage.

Questions

Please choose correct answer by circling the letter in front of the statement you find best suits definitions provided.

1 **Which of the following can be considered as a type of secondary storage devices?**

a) Cache memory
b) Hard disk drive (HDD)
c) Random access memory (RAM)
d) Solid state disk (SSD)

2 **Which of the following is also known as the CPU in a computer system?**

a) Memory
b) Processor
c) Bus
d) Input/Output Device

3 **Which of the following are fundamental hardware components of a computer system?**

a) Processor
b) Memory
c) Operating System
d) Input/Output Devices
e) Buses

4 **Which of the following can be considered as input/output device?**

a) USB flash drive
b) Bar-code scanner
c) Radio frequency identification (RFID) device
d) Plotter

5 **Which of the following belong to the class of portable computers?**

a) Tablet
b) Nettop computer
c) Smartphone
d) Laptop

6 **A key difference between grid computing, multiprocessing, and parallel processing is that _____.**

a) parallel processing is only employed with supercomputers
b) grid computing is only employed with supercomputers
c) multiprocessing only applies to server computers
d) grid computing relies on a community of computers acting together.

7 **_____ is a class of computer used by people on the move to run personal productivity software, access the Internet, read and prepare email and instant messages, play games, listen to music, access corporate applications and databases, and enter data at the point of contact.**

a) Single-user nonportable computer
b) Single-user portable computer
c) Multiple-user computer
d) Notebook computer

8 **_____ are three subclasses of computers associated with the multiple-user computer.**

a) Smartphone, laptop, notebook, and tablet
b) Thin client, desktop, nettop, and workstation
c) Server, mainframe, and supercomputer
d) Notebook, server, and nettop

9 **A data center designed to have an expected annual downtime of less than 30 minutes and able to handle a power outage of up to four days is a tier _____ data center.**

a) 1
b) 2
c) 3
d) 4

10 **_____ is not a specific goal of green computing.**

a) Reducing the use of hazardous material
b) Lowering power-related costs
c) Combating global climate change
d) Enabling the safe disposal and/or recycling of IT products

11 **The two basic types of software are application software and _____ software.**

12 **The operating system plays no role in controlling access to system resources to provide a high level of security against unauthorized access to the users' data and programs as well as record who is using the system and for how long.**

a) True
b) False

13 **Which of the following is not associated with the implementation of server virtualization?**

a) Lower capital costs for hardware
b) Decreased energy costs to power the servers and cool the data center
c) Increase in the number of software licenses that must be purchased
d) Fewer personnel required to operate and support the servers.

14 **_____ is a software design approach based on the use of discrete pieces of software (modules) to provide specific functions (such as displaying a customer's bill statement) as services to other applications.**

a) Server virtualization
b) Multiprocessing
c) Grid computing
d) Service-oriented architecture

15 **_____ is a class of software used to meet organization-wide business needs and typically shares data with other enterprise applications used within the organization.**

16 **When comparing off-the-shelf software to proprietary software, which of the following statements is not true:**

a) Off-the-shelf software might not match current work processes and data standards.
b) The initial cost of the off-the-shelf software is likely greater.
c) Off-the-shelf software may include features that the organization or user does not require and never uses.
d) Off-the-shelf software may lack important features thus requiring future modification or customization.

17 **Which of the following is not a true statement about the software as a service model.**

a) SaaS applications are available from any computer or any device—anytime, anywhere.
b) There are no software patches for customers to download or install.
c) The cost associated with upgrades and new releases are lower than the traditional model.
d) The SaaS subscriber must manage service levels and availability, so there may be a need to add hardware, software, or communications capacity as the number of users increases.

18 **What is the main purpose of a database?**

a) To provide cloud storage
b) To organize hardware components
c) To provide organized, relevant data to support decision-making
d) To encrypt all user data

19 **The database approach allows multiple information systems to:**

a) Work offline independently
b) Use proprietary file formats
c) Share a pool of related data
d) Operate without a DBMS

20 **Which of the following are advantages of the database approach?**

a) Reduced data redundancy
b) Improved data integrity
c) Easier data access
d) Increased hardware cost

21 **Which are common database activities performed by organizations?**

a) Creating and maintaining records
b) Querying data
c) Generating reports
d) Programming operating systems

22 **Which components are typically part of a database system?**

a) Hardware
b) Software
c) Data
d) People

23 **What is the primary purpose of database normalization?**

a) Improve data security
b) Speed up data processing
c) Eliminate data redundancies and ensure logical dependencies
d) Delete outdated data

24 **Which property is not one of the ACID properties of SQL databases?**

a) Atomicity
b) Flexibility
c) Consistency
d) Durability

25 **In a relational database, a foreign key:**

a) Uniquely identifies records
b) Refers to the primary key in another table
c) Must always be null
d) Is used only in one-to-one relationships

26 **Which of the following is a correct data hierarchy from smallest to largest?**

a) Database → Record → File → Attribute
b) File → Record → Attribute → Data item
c) Data item → Attribute → Entity → File → Database
d) Attribute → Database → File → Record

27 **Which tool contains descriptions of all data in a database?**

a) Data cube
b) Schema viewer
c) Data dictionary
d) Data filter

28 **Which of the following are examples of relational database management systems (RDBMS)?**

a) Oracle
b) Microsoft SQL Server
c) MySQL
d) Microsoft Excel

29 **The most commonly used query language in relational databases is:**

a) SQL
b) Python
c) NoSQL
d) Java

30 **Which of these is NOT a fundamental characteristic of a relational database?**

a) Two-dimensional tables
b) Each row is an entity
c) Tables must be encrypted
d) Each row has a unique primary key

31 **What is the term for raw facts such as numbers and names?**

a) Information
b) Data
c) Knowledge
d) Attributes

32 **Which of the following best describes an entity?**

a) A single value in a database
b) A person, place, or thing for which data is collected
c) A database management system
d) A key constraint

33 **Which of the following best describes a database schema?** $\frac{z}{w}$

a) A user interface
b) A description of the structure of a database
c) A backup system
d) A report format

34 **Which role is responsible for managing databases within an organization?** $\frac{z}{w}$

a) Data analyst
b) Database administrator (DBA)
c) IT helpdesk
d) Software tester

35 **Which of the following is an example of a primary key?**

a) A foreign identifier
b) A unique customer ID
c) Customer name
d) Product description

36 **What does data cleansing involve?**

a) Encrypting user data
b) Correcting or deleting inaccurate or irrelevant data
c) Normalizing tables
d) Compressing databases

37 **Which of the following are characteristics of big data?**

a) Value
b) Volume
c) Velocity
d) Visuality

38 **Which database type can scale horizontally and is suitable for unstructured data?**

a) SQL
b) NoSQL
c) Flat file
d) In-memory

39 **The primary advantage of using an in-memory database is:**

a) Cheaper than disk storage
b) Faster access to data
c) Easier installation
d) Longer data retention

40 **Which of the following best describes a data warehouse?**

a) A platform for storing unprocessed data
b) A large repository of integrated data for reporting and analysis
c) A user interface for dashboards
d) A real-time social media feed

41 **Which two components make up the Hadoop environment?**

a) Hive and HDFS
b) MapReduce and HDFS
c) ETL and SQL
d) NoSQL and MapReduce

42 **A data warehouse differs from a data lake in that:**

a) It stores processed data in a structured format
b) It is unstructured
c) It stores all raw data
d) It can't handle structured queries

43 **What are components required for effective BI and analytics?**

a) High-quality data
b) Skilled analysts and data scientists
c) Analytical tools and infrastructure
d) Manual data entry systems

44 **What is the purpose of the 'Transform' step in ETL?**

a) Extract the data
b) Format data for analysis
c) Load data into systems
d) Encrypt the data

45 **Which of the following statements best defines predictive analytics?**

a) It forecasts future outcomes using current and historical data
b) It only visualizes past data
c) It stores data for reporting
d) It replaces the need for BI

46 **A data scientist must have:**

a) Only programming skills
b) Analytical mindset and business acumen
c) Marketing knowledge
d) Graphic design expertise

47 **Descriptive analytics includes which of the following techniques?**

a) Linear programming
b) Visual analytics
c) Monte Carlo simulation
d) Scenario analysis

48 **Which of the following best describes a data mart?**

a) A subset of a data warehouse focused on a specific function
b) An unstructured data pool
c) A legacy system
d) A flat file system

49 **The goal of business intelligence is to:**

a) Replace data warehouses
b) Support improved decision-making
c) Generate automatic reports only
d) Secure sensitive information

50 **Which technology can store all raw, unprocessed data?**

a) Data mart
b) SQL database
c) Data Lake
d) Dashboard

51 **Which platform would likely be used for processing petabytes of unstructured data across many servers?**

a) SQL Server
b) Hadoop
c) Excel
d) OLAP cube

52 **Which of these are goals of analytics in business?**

a) Optimize current operations
b) Forecast future performance
c) Replace business processes
d) Avoid using historical data

53 **What does the "Extract" step in ETL refer to?**

a) Retrieving data from various source systems
b) Encrypting data during storage
c) Formatting data for dashboards
d) Generating summary reports

54 **Which of the following tools is commonly used for visual analytics?**

a) SQL
b) Tableau
c) Hadoop
d) HDFS

55 **What are common sources of big data?**

a) Social Media
b) Internet of Things (IoT) sensors
c) Transaction records
d) Printed newspapers

56 **Which of the following are examples of business intelligence (BI) tools?**

a) Dashboards
b) Online Analytical Processing (OLAP)
c) Data visualization tools
d) Antivirus software

57 **Which of the following are challenges associated with big data?**

a) Ensuring data quality
b) Managing data volume and speed
c) Securing sensitive data
d) Designing basic spreadsheets

58 **Which analytics types are commonly used in business?**

a) Descriptive analytics
b) Predictive analytics
c) Prescriptive analytics
d) Imaginary analytics

59 **_____ is the shape or structure of a network, including the arrangement of the communication links and hardware devices on the network.**

60 **Which network topology connects all devices through a single central device called the hub node?**

a) bus network
b) mesh network
c) ring network
d) star network

61 **Which network topology connects all network devices to a common backbone that serves as a shared communications medium?**

a) bus network
b) mesh network
c) ring network
d) star network

62 **Which type of network uses multiple access points to link devices and create a connection across a large area?**

a) star network
b) ring network
c) mesh network
d) bus network

63 **Which of the following are types of networks that can be classified based on physical distance and the services they provide?**

a) personal area network
b) local area network
c) global area network
d) metropolitan area network
e) wide area network

64 **A personal area network (PAN) is a wireless network that connects information technology devices close to one person.**

a) True
b) False

65 **A network that connects computer systems and devices within a small area, such as an office, home, or several floors in a building is a _____.**

66 **_____ is a network that connects users and their computers in a geographical area that spans a campus or city.**

67 **_____ is a network that connects large geographic regions.**

68 **What does channel bandwidth refer to in a communications channel?**

a) the physical length of the cable used
b) the number of connected devices
c) the capacity to carry traffic, usually measured in megabits or gigabits per second
d) the power supply to the network devices

69 **_____ measures how long it takes for a unit of data to get to its destination and back again.**

70 **Which of the following best describes the two broad categories of transmission media?**

a) analog and digital transmission media
b) wired and optical transmission media
c) guided (wired) and wireless transmission media
d) solid and fluid transmission media

71 **The three most common guided transmission media types are?**

a) Twisted-pair wire
b) Near field communication
c) Coaxial cable
d) Fiber-optic cable
e) Bluetooth
f) Wi-fi

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73 **What is the main function of a Network Operating System (NOS)?**

a) to design computer hardware components
b) to manage internet browsing and email services
c) to control networked computer systems and enable communication between them
d) to protect computers from viruses and malware

74 **What is the main purpose of the Transmission Control Protocol/Internet Protocol (TCP/IP)?**

a) to physically connect computers to a network
b) to format documents for printing
c) to interconnect network devices on a packet-switching network like the Internet
d) to manage user accounts and passwords on a network

75 **Why must each computer connected to the Internet have a unique IP address?**

a) to prevent unauthorized software installation
b) to identify the manufacturer of the device
c) to allow global access to the local network
d) to uniquely identify it on the global Internet network

76 **What is the primary function of a network switch?**

a) to convert digital signals into analog signals
b) to assign IP addresses to network devices
c) to direct data packets to the correct port using MAC addresses
d) to provide wireless access to mobile devices

77 **What is the main function of a router in a network?**

a) to assign MAC addresses to devices
b) to store and retrieve data from servers
c) to direct data packets to other networks based on their destination address
d) to convert data packets into electrical signals

78 **How do users in organizations or at home typically access the Internet?**

a) through a private satellite connection
b) by connecting directly to a web server
c) through an Internet service provider (ISP)
d) by using a local printer network

79 **What does cloud computing refer to?**

a) a local network where users store and access data without the Internet
b) a computing environment where software and storage are provided as an Internet service and accessed through a web browser
c) a method of increasing the speed of a computer by adding more memory
d) a programming technique for building desktop applications

80 **Which of the following is not a common deployment model of cloud computing?**

a) public cloud computing
b) private cloud computing
c) hybrid cloud computing
d) traditional desktop computing

81 **Which of the following is a common deployment model of cloud computing?**

a) public cloud computing
b) private cloud computing
c) traditional desktop computing
d) hybrid cloud computing

82 **In a public cloud computing environment, who owns and manages the infrastructure?**

a) the government
b) each individual tenant
c) a service provider organization
d) a private company using its own internal IT team

83 **What are the three main types of services in public cloud computing?**

a) hardware as a service, network as a service, and data as a service
b) infrastructure as a service, platform as a service, and software as a service
c) web hosting, database management, and virtualization
d) internet services, cloud storage, and email hosting

84 **What best describes Infrastructure as a Service (IaaS)?**

a) a model where an organization builds and maintains its own IT infrastructure
b) a service in which the organization outsources equipment like servers and storage, which are owned and maintained by a provider
c) a software delivery model used only for mobile apps
d) a platform where developers build and deploy applications without internet access

85 **What does Platform as a Service (PaaS) provide to users?**

a) only cloud storage for backing up files
b) access to physical hardware and network equipment
c) a computing platform with tools like an operating system, programming environment, and database services
d) pre-installed software that cannot be modified

86 **_____ is a software delivery approach that provides**

a) users with access to software remotely as a Web-based service.

87 **What is a common challenge organizations may face when transitioning to public cloud computing?**

a) guaranteed performance and simple pricing
b) improved data security and vendor independence
c) complex pricing, inconsistent performance, and potential vendor lock-in
d) inability to access cloud services via the Internet

88 **A _____ is a single-tenant cloud.**

89 **Why do organizations often choose to implement a private cloud?**

a) to reduce the need for internal IT staff
b) because public cloud services are unavailable
c) due to concerns about data security in a public cloud
d) to increase dependence on third-party providers

90 **What defines a hybrid cloud computing environment?**

a) a cloud made up of multiple public cloud providers only
b) a network of private clouds with no public cloud involvement
c) an environment combining public and private clouds integrated through a private network
d) a single public cloud that offers private user accounts

91 **_____ is a network of physical objects or "things" embedded with sensors, processors, software, and network connectivity capability to enable them to exchange data with the manufacturer of the device, device operators, and other connected devices.**

92 **_____ is a device that is capable of sensing something about its surroundings, such as pressure, temperature, humidity, pH level, motion, vibration, or level of light.**

93 **In which of the following areas is IoT (Internet of Things) technology commonly used?**

a) traditional desktop applications
b) automated homes, wearable devices, smart cities, and autonomous vehicles
c) manual machinery and landline telephones
d) offline file sharing and printed maps

94 **How can IoT technology help organizations reduce operational costs?**

a) by eliminating the need for all human labor
b) by automating customer service chatbots
c) by monitoring equipment to prevent downtime and managing energy usage
d) by increasing advertising spending

95 **In what way can IoT deepen an organization's understanding of consumer behavior?**

a) by generating random customer surveys
b) by analyzing data from video surveillance, social media, and Internet usage
c) by outsourcing marketing operations
d) by installing smart vending machines

96 **How can IoT contribute to workplace safety?**

a) by training employees in virtual reality
b) by providing ergonomic office furniture
c) by using sensors in safety gear and smart surveillance to monitor workers and environments
d) by increasing the number of supervisors on-site

97 **Which of the following are classified types of IoT applications? (Select 4 that apply)**

a) connect and monitor
b) control and react
c) organize and optimize
d) predict and adapt
e) store and retrieve
f) transform and explore

98 **What is the main goal of e-commerce?**

a) Reducing network latency
b) Conducting business electronically
c) Managing employees remotely
d) Creating social media ads

99 **An effective e-commerce strategy must first define:**

a) Mobile carrier
b) Business goals and model
c) Web page color scheme
d) Print advertising approach

100 **Which of the following is NOT a type of e-commerce?**

a) B2B
b) B2C
c) H2O
d) C2C

101 **What is the primary feature of m-commerce?**

a) Conducting business by fax
b) Conducting business via mobile devices
c) Using desktop websites
d) Using kiosks

102 **Which three components form a successful e-commerce model?**

a) Control, capital, collaboration
b) Content, commerce, community
c) Culture, clicks, communication
d) Company, code, customer

103 **Which of the following are key benefits of e-commerce?**

a) Reaching new customers
b) Reducing operating costs
c) Increasing transaction speed
d) Eliminating the need for marketing

104 **Which form of e-commerce allows consumers to sell to other consumers?**

a) B2B
b) C2C
c) G2C
d) B2E

105 **What is a digital certificate used for in e-commerce?**

a) Issuing warranties
b) Verifying identity online
c) Promoting brands
d) Tracking customer location

106 **Which of the following are key infrastructure components for e-commerce?**

a) Web server software
b) E-commerce software
c) High-speed internet connection
d) Office furniture

107 **A key characteristic of successful m-commerce is:**

a) Use of smartphones and wireless devices
b) Access to VPN networks
c) Dependence on fax machines
d) Large screen devices

108 **Which of these is considered a B2C e-commerce company?**

a) Grainger
b) Amazon
c) Cisco
d) Oracle

109 **The term ‘electronic cash’ refers to:**

a) Paper checks sent electronically
b) Digital forms of currency for online payment
c) Credit card points
d) Tax refunds

110 **Which of the following are examples of electronic payment systems?**

a) PayPal
b) Venmo
c) LinkedIn
d) Excel

111 **A storefront broker helps businesses:**

a) Manufacture goods
b) Connect with online customers
c) Develop warehouse layouts
d) Install firewalls

112 **Which of the following challenges must be addressed in e-commerce?**

a) Consumer trust
b) Global infrastructure
c) Currency exchange
d) Local printing

113 **Which country dominates the global B2C market in sales volume?**

a) United States
b) China
c) Japan
d) Germany

114 **Which are the reasons why companies adopt e-commerce?**

a) Lower distribution costs
b) Greater market reach
c) More employees
d) Higher inventory levels

115 **Which concept involves targeting marketing messages to individual users?**

a) Segmentation
b) Personalization
c) Visualization
d) Verification

116 **A buy-side e-commerce activity includes:**

a) Comparing suppliers
b) Creating social media ads
c) Selling products
d) Managing logistics

117 **Which of the following are examples of m-commerce functionality?**

a) Mobile banking
b) QR code payment
c) In-person consultation
d) Telephone-only ordering

118 **What is the primary purpose of enterprise systems?**

a) Minimize customer feedback
b) Perform only accounting tasks
c) Integrate information across business functions
d) Eliminate the need for IT staff

119 **Which of these are core components of an ERP system?**

a) Inventory management
b) Order processing
c) Graphic design
d) Web hosting

120 **Which business function is NOT typically supported by enterprise systems?**

a) Manufacturing
b) Sales
c) Entertainment media streaming
d) Human resources

121 **What is ERP?**

a) Electronic Record Protocol
b) Enterprise Retail Platform
c) Enterprise Resource Planning
d) Executive Reporting Process

122 **Which of these are benefits of implementing ERP?**

a) Improved access to data
b) Process standardization
c) Elimination of legacy systems
d) Increased software development

123 **What is the key data handling feature of an ERP system?**

a) Stand-alone databases
b) Centralized shared database
c) Manual spreadsheet tracking
d) Visual-only dashboards

124 **Which type of transaction processing is done immediately?**

a) Batch processing
b) Online transaction processing (OLTP)
c) Scheduled processing
d) Predictive processing

125 **A CRM system primarily supports which activities?**

a) Inventory control
b) Marketing and sales
c) Customer service
d) Payroll

126 **Which of the following is true about source data automation?**

a) It reduces human data entry errors
b) It increases the need for manual rework
c) It speeds up data collection
d) It is only used in manufacturing

127 **Which system manages the product lifecycle from concept to retirement?**

a) ERP
b) CRM
c) PLM
d) CAD

128 **Which software types are often part of PLM systems?**

a) CAD (Computer-Aided Design)
b) CAE (Computer-Aided Engineering)
c) CAM (Computer-Aided Manufacturing)
d) CRM

129 **Why are ERP systems attractive to SMEs now?**

a) Higher staff availability
b) Lower costs through cloud and hosted models
c) Guaranteed instant ROI
d) Simple manual operations

130 **Which of these are challenges in implementing enterprise systems?**

a) Managing change
b) Software customization
c) Long implementation time
d) Lack of customer interest

131 **Machine learning in enterprise systems helps decision-makers by:**

a) Providing insights faster
b) Reducing manual analysis time
c) Performing product assembly
d) Building websites

132 **Which model provides ERP via the internet without on-site installation?**

a) Local server model
b) Cloud-based model
c) Virtual machine model
d) Peer-to-peer network

133 **Which of the following best defines “best practices” in ERP?**

a) Most efficient ways to complete business processes
b) Guidelines for marketing only
c) Custom software code
d) Informal habits in organizations

134 **Which statement about hosted software models is true?**

a) Only large firms benefit
b) They reduce startup costs
c) They include cloud and hybrid options
d) They require on-premises IT teams

135 **_____ include the people, procedures, hardware, software, data, and knowledge needed to develop computer systems and machines that can simulate human intelligence processes, including learning (the acquisition of information and rules for using the information), reasoning (using rules to reach conclusions), and self-correction (using the outcome from one scenario to improve its performance on future scenarios).**

136 **What has been a major focus of AI research since its earliest stages?**

a) Building faster hardware
b) Developing machines that can learn from experience
c) Creating new programming languages
d) Minimizing electricity usage in machines

137 **Which of the following is a specific characteristic of intelligent behavior?**

a) React quickly and correctly to a new situation
b) Memorize and repeat data without understanding
c) Learn from experience and apply acquired knowledge
d) Only follow pre-programmed instructions without adaptation

138 **Which of the following is a characteristic of intelligent behavior?**

a) solve problems when important information is missing
b) handle complex situations
c) perform only basic and repetitive tasks
d) avoid reacting to new situationsWhat best describes

139 **What were expert systems in relation to modern AI systems?**

a) A type of game software
b) The precursor of modern AI systems
c) A replacement for human workers
d) Irrelevant to current AI development

140 **Which of the following are characteristics of all expert systems?**

a) unreliable
b) able to process data quickly
c) capable of critical decision making
d) slow in handling data

141 **Which of the following are characteristics of all expert systems?**

a) highly effective
b) understandable
c) unreliable
d) slow in handling data

142 **Which of the following are components of an expert system?**

a) knowledge base
b) user interface
c) data storage only
d) inference engine

143 **Which of the following are components of an expert system?**

a) data storage only
b) inference engine
c) explanation facility
d) knowledge base acquisition facility

144 **_____ stores all relevant information, data, rules, cases, and relationships that the expert system uses.**

145 **Machine learning and AI are the same thing?**

a) true
b) false

146 **Which of these is not a type of training for machine learning?**

a) Semi-supervised learning
b) Reinforced learning
c) Supervised learning
d) Unsupported learning

147 **Which of the following are examples of AI applications?**

a) Genetic algorithms
b) Intelligent agents
c) Basic arithmetic calculators
d) Static websites

148 **Which of the following are potential careers in AI?**

a) Data scientist
b) Machine learning engineer
c) Robotics scientist
d) Graphic designer

149 **_____ is a part of machine learning that allows computers to understand, analyze, manipulate, and generate natural language for processing.**

150 **Where is natural language processing (NLP) widely used?**

a) search engines
b) mechanical engineering
c) graphic design software
d) construction planning