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ACSM 040-444

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Topic Break Down

Topic	No. of Questions
Topic 1, Health and Fitness Assessment	150
Topic 2, Exercise Prescription and Implementation	127
Topic 3, Exercise Counseling and Behavior Modification	30
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QUESTION NO: 1

Any physical activity with a performance time of approximately 30 seconds or less relies on which of the following energy systems?

A. ATP.

B. PCr.

C. ATP-PCr.

D. Aerobicglycolysis.

ANSWER: C

Explanation:

ATP-PCr. is correct because very short, maximal or near-maximal physical activity is powered predominantly by the phosphagen energy system, also called the ATP-PCr system. Skeletal muscle maintains a small, immediately available ATP supply, while phosphocreatine (PCr) rapidly donates a phosphate group to regenerate ATP as it is used for muscular contraction. This reaction occurs rapidly and does not require oxygen, making it especially important at exercise onset and during brief, high-intensity efforts such as a short sprint, jump, or maximal lift.

The ATP-PCr system has the highest rate of ATP resynthesis of the body's energy pathways, but its capacity is limited by the small intramuscular stores of ATP and PCr. It is therefore the principal energy source for efforts lasting only seconds and remains a key contributor across activities of roughly 30 seconds or less, although energy metabolism always involves some overlap among pathways. This time-based description is consistent with exercise-physiology teaching on immediate energy provision and phosphocreatine's role in rapid ATP regeneration. See the NCBI Bookshelf overview of muscle energy metabolism and the ACSM's Guidelines for Exercise Testing and Prescription.

QUESTION NO: 2

During a symptom-limited graded exercise test, which findings are indications to terminate the test?

A. Moderate-to-severe angina

B. Fall in systolic blood pressure greater than 10 mm Hg with ischemic evidence

C. Signs of poor perfusion or central nervous system symptoms

D. Expected leg fatigue near the end of a test

E. Heart rate that increases with workload

ANSWER: A B C

Explanation:

Moderate-to-severe angina, a fall in systolic blood pressure greater than 10 mm Hg with increasing workload when accompanied by other evidence of ischemia, and signs of poor perfusion are indications to terminate an exercise test. Signs of poor perfusion can include cyanosis, pallor, ataxia, dizziness, or confusion. These findings may indicate myocardial ischemia, inadequate cardiac output, or another potentially dangerous clinical response.

Expected fatigue alone is not necessarily an indication for immediate termination if the participant remains clinically stable and wishes to continue. Exercise-test termination decisions should incorporate symptoms, ECG findings, blood pressure, appearance, and the supervising clinician's judgment. See ACSM's Guidelines for Exercise Testing and Prescription.

QUESTION NO: 3

A client with chronic heart failure is participating in supervised aerobic exercise. Which programming or monitoring practices are appropriate?

A. Use a gradual warm-up and cool-down

B. Monitor dyspnea, fatigue, and perceived exertion

C. Report a rapid unexplained increase in body mass

D. Continue exercise despite worsening dyspnea at rest

E. Use maximal exertion as the primary daily intensity goal

ANSWER: A B C

Explanation:

Appropriate practices include using a gradual warm-up and cool-down, monitoring symptoms and perceived exertion, and adjusting exercise according to daily changes in clinical status. Clients with heart failure may have variable exercise tolerance related to fluid status, medication changes, arrhythmias, or disease progression. A sudden increase in body mass can indicate fluid retention and warrants communication with the treating medical team according to the established care plan.

Exercise should be deferred when the client has acute decompensated symptoms, such as worsening dyspnea at rest or rapidly increasing edema, until medical evaluation has occurred. See the American Heart Association overview of heart failure.

QUESTION NO: 4

Which eating disorder is marked by an overwhelming fear of becoming fat, a distorted body image, and extreme restrictive eating?

A. Bulimia.

B. Anorexia nervosa.

C. Chronic dieting.

D. Yo-yo dieting.

ANSWER: B

Explanation:

Anorexia nervosa is characterized by persistent restriction of energy intake that results in significantly low body weight, an intense fear of gaining weight or becoming fat, and a disturbance in the way body weight or shape is experienced. The described overwhelming fear of fatness, distorted body image, and extreme restrictive eating are therefore hallmark clinical features of this disorder. Restriction may involve severely limiting food intake, avoiding particular foods, and engaging in behaviors intended to prevent weight gain despite medical or psychosocial consequences. In clinical exercise settings, these features warrant prompt recognition because anorexia nervosa can be associated with serious complications, including bradycardia, hypotension, reduced bone density, electrolyte abnormalities, and impaired exercise tolerance. Exercise professionals should use a supportive, nonjudgmental approach and refer clients for appropriate medical and mental-health evaluation rather than attempting to manage an eating disorder independently. The National Institute of Mental Health summarizes anorexia nervosa as involving restricted eating, intense fear of weight gain, and distorted body image. Diagnostic criteria and clinical context are also outlined by the National Institute of Mental Health and the National Eating Disorders Association.

QUESTION NO: 5

Which of the following statements about injury reporting is NOT correct?

A. A process for injury reporting, backed up with a form, should be developed.

B. The process to be used and the accompanying forms must be part of the P&P manual.

C. Injury reporting forms must be kept under lock and key, just like data records.

D. A physician should sign every injury report form that is filed.

ANSWER: D

Explanation:

“A physician should sign every injury report form that is filed.

” is the statement that is NOT correct. In an exercise, clinical, or health-fitness setting, an injury or incident report is an internal factual record used to document what occurred, when and where it occurred, who was involved, immediate actions taken, and any follow-up required. The staff member who observed or managed the event, along with the appropriate supervisor under the organization’s established procedures, should complete the report promptly and objectively. A physician’s assessment, referral, or medical documentation may be needed when the participant’s condition warrants medical evaluation, but physician review and signature are not routine requirements for every incident report. Requiring such a signature for every report could delay timely documentation and is inconsistent with the purpose of a facility incident-reporting process. Medical information that is obtained should be handled according to applicable privacy practices and retained securely. ACSM’s professional guidance emphasizes appropriate emergency policies, procedures, and documentation within supervised exercise settings; see ACSM’s Guidelines for Exercise Testing and Prescription. For general occupational injury-recordkeeping principles, including documentation responsibilities, consult OSHA Recordkeeping.

QUESTION NO: 6

A client with stable coronary artery disease is participating in supervised exercise and develops mild angina while walking. Which actions are appropriate? Select all that apply.

A. Stop or reduce the exercise workload.

B. Place the client at rest and monitor symptoms.

C. Follow the protocol for prescribed nitroglycerin.

D. Continue at the same workload if blood pressure is stable.

E. Activate emergency procedures if symptoms persist or worsen.

ANSWER: A B C E

Explanation:

Appropriate actions include stopping or reducing the exercise workload, having the client sit or otherwise rest in a safe position, monitoring symptoms and hemodynamic status, and following the established protocol for prescribed nitroglycerin and emergency activation. Angina caused by myocardial ischemia should improve promptly with rest and, when prescribed and indicated, nitroglycerin.

Continuing exercise despite angina is inappropriate because it may increase myocardial oxygen demand and worsen ischemia. The client should not resume exercise that day unless symptoms fully resolve and program policy, medical orders, and clinical judgment support resumption. Angina that persists, worsens, or is accompanied by concerning signs requires emergency evaluation. See the American Heart Association resource on angina and ACSM’s Guidelines for Exercise Testing and Prescription.

QUESTION NO: 7

Which practices are appropriate when measuring resting blood pressure manually in a clinical exercise setting? Select all that apply.

A. Allow quiet seated rest before measurement

B. Support the arm at heart level

C. Use a cuff with an appropriate bladder size

D. Have the participant cross the legs

E. Encourage conversation during the reading

ANSWER: A B C

Explanation:

The participant should rest quietly before measurement, sit with the back supported and feet flat on the floor, and keep the supported arm at heart level. A properly sized cuff is also necessary because an undersized cuff can falsely elevate the measured blood pressure.

Crossing the legs and talking during measurement can alter the result and should be avoided. Standardized technique improves the reliability of serial blood pressure measurements. See the American Heart Association blood pressure measurement guidance.

QUESTION NO: 8

Which medication classes may attenuate the heart-rate response to exercise and should be considered when prescribing heart-rate-based aerobic intensity targets?

A. Beta-blockers

B. Verapamil or diltiazem

C. Angiotensin-converting enzyme inhibitors

D. Topical antifungal medications

ANSWER: A B

Explanation:

Beta-blockers and the nondihydropyridine calcium-channel blockers verapamil and diltiazem may attenuate the heart-rate response to exercise. These medications slow sinoatrial-node activity and/or atrioventricular conduction, which can make age-predicted or standard heart-rate targets inaccurate for some clients.

When heart rate is altered by medication, the clinical exercise physiologist should use individualized exercise-test data when available and supplement heart-rate monitoring with RPE, symptoms, workload, and blood-pressure response. ACE inhibitors do not typically blunt the chronotropic response in the same manner. See ACSM's Guidelines for Exercise Testing and Prescription.

QUESTION NO: 9

What is an appropriate initial weight loss goal for an obese individual desiring weight reduction?

A. 10%initial body weight in first 6 months.

B. 20 pounds in 2 months.

C. 5 pounds per week for the first 6 weeks, then weight maintenance.

D. BMI of less than 18.5.

ANSWER: A

Explanation:

An initial goal of losing 10% of initial body weight in the first 6 months is appropriate because it is clinically meaningful, achievable for many individuals, and consistent with evidence-based obesity-management guidance. A modest reduction in body mass, commonly framed as approximately 5% to 10% over about 6 months, can produce important health benefits even when the person does not reach an “ideal” body weight. These benefits may include improved blood pressure, glycemic control, triglyceride concentrations, and overall cardiometabolic risk.

This goal also supports a gradual, sustainable approach to energy deficit, nutrition changes, physical activity, and behavioral strategies. In clinical exercise settings, establishing a realistic early target helps promote adherence and allows the exercise professional and patient to monitor progress, address barriers, and adjust the plan without encouraging overly rapid loss. The National Heart, Lung, and Blood Institute describes an initial target of about 10% of baseline weight over 6 months as a reasonable treatment goal. The Centers for Disease Control and Prevention likewise notes that modest weight loss can yield meaningful health benefits. See NHLBI behavioral treatment guidance and CDC guidance on losing weight.

QUESTION NO: 10

What is OSHA?

A. A state agency that licenses medical facilities.

B. A federal agency that sets and enforces workplace safety and health standards.

C. An agency that certifies a managed care organization.

D. A state agency that inspects emergency protocols within medical facilities.

ANSWER: B

Explanation:

OSHA is the Occupational Safety and Health Administration, a federal agency within the U.S. Department of Labor. Its central role is to assure safe and healthful working conditions for employees by establishing and enforcing workplace safety and health standards. In health care and clinical exercise settings, OSHA requirements can apply to occupational exposures and hazards such as bloodborne pathogens, hazard communication, personal protective equipment, emergency action planning, and recordkeeping. Employers are responsible for providing a workplace free from recognized serious hazards and for complying with applicable OSHA standards; employees may also report unsafe conditions or request an OSHA inspection. OSHA’s authority focuses on the safety and health of workers, including clinical staff, rather than licensing facilities or certifying managed-care organizations. This makes “A federal agency that sets and enforces workplace safety and health standards” the most accurate description. See OSHA’s overview of its mission and functions at https://www.osha.gov/aboutosha and the U.S. Department of Labor’s OSHA agency page at https://www.dol.gov/agencies/osha.

QUESTION NO: 11

A client’s resting blood pressure is 128/76 mm Hg while seated. After standing quietly for 3 minutes, the client reports light-headedness and blood pressure is 106/64 mm Hg. This response is most consistent with

A. Orthostatic hypotension.

B. Exaggerated exercise pressor response.

C. Resting hypertension.

D. Normal postexercise hypotension.

ANSWER: A

Explanation:

Orthostatic hypotension is correct. Orthostatic hypotension is generally defined as a decrease in systolic blood pressure of at least 20 mm Hg or a decrease in diastolic blood pressure of at least 10 mm Hg within 3 minutes of standing. In this case, systolic pressure decreased by 22 mm Hg and diastolic pressure decreased by 12 mm Hg, accompanied by symptoms.

The clinical exercise physiologist should assist the client to a safe position, monitor symptoms and vital signs, and communicate the finding according to the program's clinical procedures. Exercise may need to be deferred or modified until the cause has been evaluated, particularly if symptoms are recurrent. Orthostatic hypotension may be associated with dehydration, medication effects, autonomic dysfunction, or other medical conditions. See the American Heart Association overview of orthostatic hypotension.

QUESTION NO: 12

Which practices are appropriate when supervising aerobic exercise for a client with an implanted cardioverter-defibrillator (ICD)? Select all that apply.

A. Verify device-related exercise instructions before training.

B. Keep exercise heart rate below the device therapy threshold.

C. Stop exercise and assess the client after an ICD shock.

D. Independently adjust device settings before exercise.

E. Place external defibrillation pads directly over the device.

ANSWER: A B C

Explanation:

Appropriate practice includes obtaining the client's device information and exercise-related medical recommendations, monitoring exercise intensity to remain below the programmed ICD detection or therapy threshold, and educating the client to report palpitations, dizziness, chest discomfort, or an ICD shock immediately. A heart-rate buffer below the device threshold is commonly used when a reliable heart-rate response is available, but the specific buffer and exercise limits should follow the treating cardiology team's instructions.

An exercise professional should not independently reprogram an ICD or assume that a shock is harmless. If an ICD shock occurs, exercise should stop and the client should be assessed according to emergency procedures; urgent evaluation is particularly important for persistent symptoms, multiple shocks, or signs of instability. External defibrillation pads should not be placed directly over the implanted device. See the American Heart Association overview of ICDs.

QUESTION NO: 13

Which resistance-training practices are appropriate for a client with controlled hypertension?

A. Use rhythmic breathing during each repetition

B. Begin with light-to-moderate resistance

C. Use controlled dynamic movements

D. Hold the breath during the concentric phase

E. Perform repeated maximal lifts to build tolerance

ANSWER: A B C

Explanation:

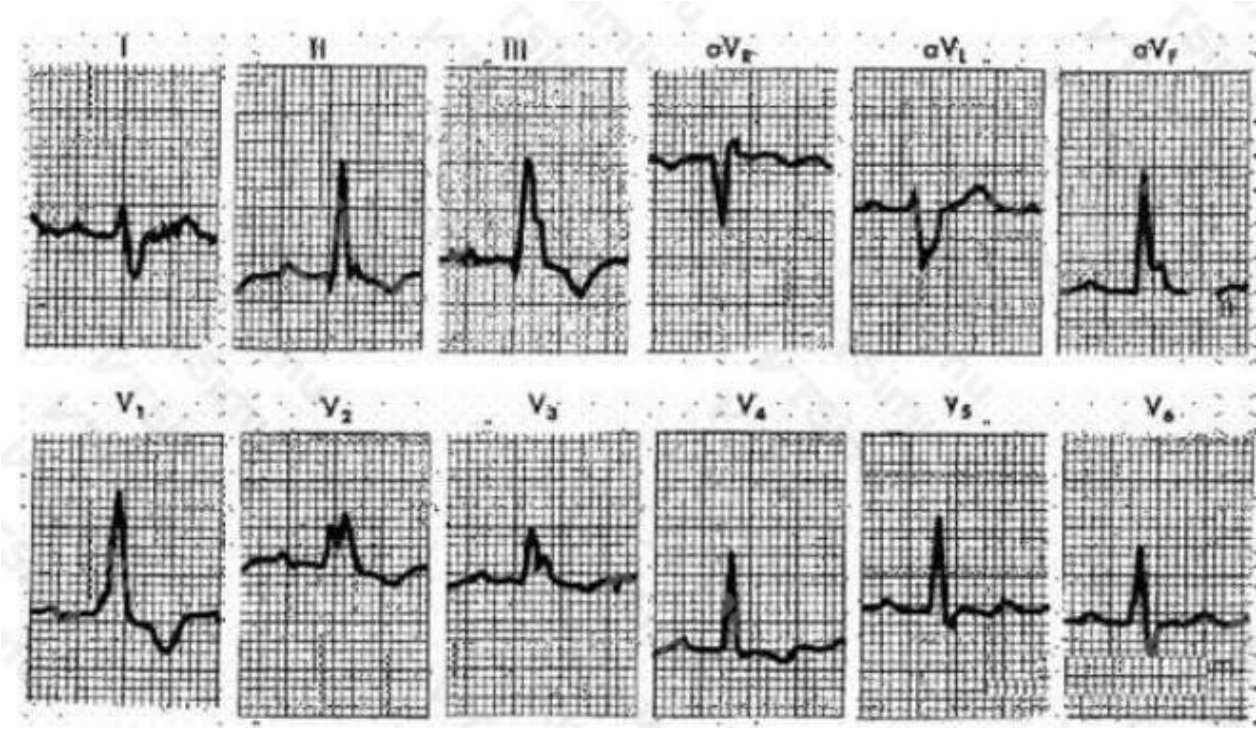
Appropriate practices include using rhythmic breathing to avoid a Valsalva maneuver, beginning with relatively light-to-moderate loads, and using controlled dynamic repetitions. Breath holding and heavy near-maximal lifting can produce

marked transient increases in blood pressure and should generally be avoided, particularly when beginning a program or when blood pressure control is uncertain.

Resistance exercise can be beneficial for many clients with hypertension when it is individualized and progressed appropriately. Blood pressure, symptoms, medication effects, and overall cardiovascular risk should be considered when prescribing exercise. See the American Heart Association guidance on physical activity and blood pressure.

QUESTION NO: 14

In the ECG strip shown below, what abnormality is indicated?



A. LBBB.

B. Posterior wall MI.

C. RBBB.

D. LVH.
(From Goldberger AL: Clinical Electrocardiography: A Simplified Approach, 6th ed. St. Louis, Mosby, 1999, p 70.)

ANSWER: C

Explanation:

Right bundle branch block is indicated. This conduction abnormality occurs when activation of the right ventricle is delayed because the right bundle branch does not conduct normally. Septal and left-ventricular activation proceed first through the intact left-sided conduction system; the right ventricle is then activated late by slower cell-to-cell myocardial conduction. On a standard ECG, this delayed terminal right-ventricular activation produces a widened QRS complex when the block is complete, typically at least 120 ms, with a terminal positive deflection in the right precordial leads (classically an rSR′ or rsR′ configuration in V1–V2). Broad terminal S waves may also be visible in lateral leads. The strip's terminal QRS morphology is characteristic of this sequence of delayed right-ventricular depolarization, supporting right bundle branch block as the appropriate interpretation. Bundle-branch-block terminology and diagnostic ECG patterns are standardized in the American Heart Association/American College of Cardiology Foundation/Heart Rhythm Society recommendations for ECG interpretation; see AHA/ACCF/HRS recommendations for intraventricular conduction disturbances. A concise clinical description of right bundle branch block and its ECG features is also available from Merck Manual Professional Edition.

QUESTION NO: 15

How much weight will the woman (from question 22) lose in 26 weeks if she integrates a 1-mile walk, taken three times per week, into her weight loss program?

A. 3 pounds.

B. 6 pounds.

C. 11 pounds.

D. 15 pounds.

ANSWER: A

Explanation:

3 pounds. is correct. The walking plan adds three 1-mile walks each week for 26 weeks, producing a total of 78 miles walked. Using the estimated energy expenditure for the woman established in question 22, this additional activity produces approximately 10,000 kcal of cumulative energy expenditure over the full 26-week period. Applying the conventional exam calculation that roughly 3,500 kcal corresponds to 1 lb of body-weight change, the expected loss is about 2.9 lb, which rounds to 3 lb. This is an estimate of the contribution of the added walking alone, assuming that food intake and all other components of energy balance remain unchanged. In real clinical practice, weight change can differ from this simple prediction because resting metabolic rate, spontaneous activity, body composition, and energy intake may adapt as body mass changes. Nevertheless, for an ACSM-style calculation based on a fixed exercise energy expenditure and the 3,500-kcal-per-pound convention, 3 pounds is the appropriate answer. ACSM emphasizes that body-weight management is driven by the relationship between energy intake and energy expenditure; see ACSM physical activity resources and the CDC overview of healthy weight.

QUESTION NO: 16

The MINIMAL duration of exercise necessary to achieve improvements in health for deconditioned individuals is

A. 20 minutes continuously.

B. 30 minutes continuously.

C. Multiple sessions of more than 10 minutes in duration throughout the day.

D. Two sessions of 20 minutes throughout the day.

ANSWER: C

Explanation:

Multiple sessions of more than 10 minutes in duration throughout the day is correct because an initially deconditioned person can accumulate activity in short, manageable bouts rather than needing to complete the entire daily exercise volume continuously. This approach supports gradual progression while still producing meaningful health benefits. In traditional ACSM exercise-prescription guidance, aerobic activity could be accumulated across the day in bouts of at least 10 minutes, provided the person achieved an appropriate total daily and weekly exercise volume. Shorter, repeated sessions can make exercise more tolerable, reduce barriers related to fatigue or low fitness, and help establish consistent participation. The exercise professional should individualize the total volume, intensity, frequency, and progression according to the person's health status, symptoms, functional capacity, goals, and response to activity. As fitness and confidence improve, session duration and overall volume can be progressed. ACSM's position stand on the quantity and quality of exercise for developing and maintaining fitness describes accumulated exercise as an acceptable approach to meeting activity recommendations: ACSM Position Stand: Quantity and Quality of Exercise. ACSM's exercise guidelines resources also emphasize individualized exercise prescription and progressive activity participation: ACSM Physical Activity Guidelines resources.

QUESTION NO: 17

During recovery from upright cycle exercise, a client's systolic blood pressure falls from 172 mm Hg at peak exercise to 118 mm Hg within 1 minute. The client remains standing and reports dizziness. What is the most appropriate immediate action?

A. Assist the client to a seated or supine position and monitor.

B. Have the client remain standing until blood pressure normalizes.

C. Immediately resume cycling at a higher workload.

D. Provide a maximal resistance exercise set.

ANSWER: A

Explanation:

Assist the client to a seated or supine position and continue monitoring is correct. A rapid reduction in blood pressure during recovery may be worsened by abrupt cessation of rhythmic lower-extremity contractions, which reduces the skeletal-muscle pump and venous return. Keeping the client standing while symptomatic increases fall risk.

The exercise professional should place the client in a safe position, continue to monitor blood pressure, heart rate, symptoms, and clinical appearance, and follow the facility's emergency procedures if symptoms do not resolve or if concerning findings develop. A gradual active cool-down helps maintain venous return and can reduce the likelihood of postexercise hypotension. See ACSM's Guidelines for Exercise Testing and Prescription.

QUESTION NO: 18

Which findings obtained during preparticipation screening should prompt referral for medical evaluation before initiating an unsupervised vigorous exercise program? Select all that apply.

A. Chest discomfort occurring with exertion

B. Unexplained syncope within the past month

C. Unusual shortness of breath during customary activity

D. Muscle soreness 2 days after an unfamiliar workout

E. Resting heart rate of 68 beats/min

ANSWER: A B C

Explanation:

Exertional chest discomfort, unexplained syncope, and unusual shortness of breath with customary activity are potentially concerning cardiovascular symptoms that warrant medical evaluation before an individual begins vigorous exercise independently. These symptoms may reflect underlying cardiovascular, pulmonary, or other clinical conditions requiring assessment.

Delayed-onset muscle soreness after an unfamiliar activity and a resting heart rate of 68 beats/min are not, by themselves, indications for medical referral. ACSM emphasizes screening for known disease, signs or symptoms suggestive of disease, and current physical activity before exercise participation. See ACSM's Guidelines for Exercise Testing and Prescription.

QUESTION NO: 19

A 110-pound female pedals a Monark cycle ergometer at 50 rpm against a resistance of 2.5 kiloponds. Calculate her absolute Yo2.

A. 300mL . min-1

B. 750mL . min-1

C. 1.25 L . min-1

D. 1.7 L. min-1

ANSWER: D

Explanation:

1.7 L. min-1 is correct. On a Monark mechanically braked cycle ergometer, one pedal revolution moves the flywheel six meters. The external work rate is therefore calculated as 2.5 kiloponds × 6 m per revolution × 50 revolutions per minute, which equals 750 kgm/min. The ACSM leg-cycle ergometry equation is: VO_2 ($mL \cdot kg^{-1} \cdot min^{-1}$) = [1.8 × work rate (kgm/min) ÷ body mass (kg)] + 7. A body mass of 110 lb converts to approximately 50 kg. Substitution gives [1.8 × 750 ÷ 50] + 7 = 34 $mL \cdot kg^{-1} \cdot min^{-1}$. Absolute oxygen consumption is obtained by multiplying the relative value by body mass: 34 $mL \cdot kg^{-1} \cdot min^{-1}$ × 50 kg = 1,700 mL/min, or 1.7 L/min. This equation includes both the oxygen cost of cycling against the stated external resistance and the resting component represented by the constant 7 $mL \cdot kg^{-1} \cdot min^{-1}$. The calculation and units align with the ACSM metabolic equations for leg cycling described in ACSM's Guidelines for Exercise Testing and Prescription; a practical description of cycle-ergometer work-rate calculation is also available from ExRx.net.

QUESTION NO: 20

Which adaptations are expected after several months of regular aerobic endurance training? Select all that apply.

A. Lower resting heart rate

B. Greater stroke volume

C. Increased skeletal-muscle capillary density

D. Increased mitochondrial oxidative capacity

E. Higher heart rate at the same submaximal workload

ANSWER: A B C D

Explanation:

Regular aerobic endurance training commonly produces a lower resting heart rate, greater stroke volume, increased skeletal-muscle capillary density, and increased mitochondrial oxidative capacity. These adaptations improve oxygen delivery and utilization and contribute to improved submaximal exercise tolerance.

At a fixed submaximal workload, trained individuals generally demonstrate a lower, not higher, heart rate. Adaptations vary with training dose, initial fitness, health status, and medication use. See ACSM's Guidelines for Exercise Testing and Prescription.

QUESTION NO: 21

A conscious client with diabetes develops shakiness, sweating, and confusion during exercise. Capillary blood glucose is 62 mg/dL. Which actions are appropriate?

A. Stop exercise

B. Provide 15 to 20 g of rapidly absorbed carbohydrate

C. Recheck blood glucose after about 15 minutes

D. Administer insulin immediately

E. Continue exercise to increase glucose use

ANSWER: A B C

Explanation:

The client has signs and a measured value consistent with hypoglycemia. Appropriate actions are to stop exercise, provide 15 to 20 g of rapidly absorbed carbohydrate, and recheck blood glucose after approximately 15 minutes. Exercise should not resume until symptoms resolve and glucose has returned to a safe range. If the client cannot safely swallow, becomes unconscious, or does not improve, emergency procedures should be activated.

Insulin should not be administered to treat hypoglycemia, and foods high in fat may delay carbohydrate absorption. See the American Diabetes Association guidance on hypoglycemia.

QUESTION NO: 22

Which exercise considerations are appropriate for a client with chronic obstructive pulmonary disease who is beginning supervised aerobic training? Select all that apply.

A. Monitor perceived dyspnea during exercise

B. Use intervals if continuous exercise is poorly tolerated

C. Include an extended warm-up and cool-down

D. Teach pursed-lip breathing when appropriate

E. Require exercise to continue despite severe worsening dyspnea

ANSWER: A B C D

Explanation:

Monitoring dyspnea with a rating scale, using interval formats when continuous exercise is poorly tolerated, and allowing an extended warm-up and cool-down are appropriate strategies for many clients with chronic obstructive pulmonary disease. These approaches help individualize intensity and may improve exercise tolerance.

Pursed-lip breathing can help some individuals manage dyspnea by promoting a slower expiratory pattern. Exercise should not be automatically stopped solely because mild, stable exertional dyspnea occurs; however, new, severe, or worsening symptoms require assessment and appropriate action. See the American Lung Association resource on exercise and COPD.

QUESTION NO: 23

Setting several short-term goals to attain a long term goal to increase self-efficacy is an example of

A. An application of cognitive-behavioral principles.

B. An evaluation.

C. A relationship to theory.

D. An explanatory theory.

ANSWER: A

Explanation:

An application of cognitive-behavioral principles. is correct because structured goal setting is a core behavioral strategy used to support health-behavior change and exercise adherence. A long-term outcome, such as establishing a sustained exercise routine, can seem distant or difficult. Breaking it into specific, achievable short-term goals gives the participant repeated opportunities to experience successful performance. These successful experiences are mastery experiences, which Bandura identified as the most influential source of self-efficacy. As the individual meets progressively challenging goals, confidence in the ability to perform the behavior increases, making continued effort and self-regulation more likely.

In clinical exercise practice, this approach commonly includes collaboratively selecting realistic, measurable goals; monitoring progress; and adjusting goals as fitness, confidence, and circumstances change. The technique therefore applies cognitive-behavioral principles by linking thoughts and expectations about capability with observable behavioral action, feedback, and reinforcement. This is consistent with social cognitive theory's emphasis on self-efficacy and self-regulatory skill development in behavior change. See Bandura's foundational discussion of self-efficacy in Psychological Review and the American Psychological Association's overview of goal setting.

QUESTION NO: 24

Which of the following diseases is NOT typically associated with obesity?

A. Diabetes.

B. Skin cancer.

C. Coronary artery disease.

D. Colon cancer.

ANSWER: B

Explanation:

Skin cancer. is the best answer because skin cancer is not generally listed among the diseases or malignancies classically associated with obesity in clinical public-health guidance. Obesity has established physiologic effects—including insulin resistance, chronic low-grade inflammation, altered sex-hormone metabolism, and changes in adipokines—that contribute to cardiometabolic disease and to risk for several specific cancers. However, the major established risk factors for the common skin cancers are exposure to ultraviolet radiation, fair skin phenotype, tanning-bed use, prior sunburns, immunosuppression, and genetic susceptibility rather than excess adiposity. Therefore, when identifying a condition that is not typically associated with obesity, skin cancer is the most appropriate selection. The CDC describes obesity as increasing risk for serious conditions, including type 2 diabetes, coronary heart disease, and several cancers, while the National Cancer Institute identifies the obesity-associated cancer sites supported by the strongest evidence; skin cancer is not included in that standard list. See the CDC overview of obesity consequences and the National Cancer Institute obesity and cancer fact sheet.

QUESTION NO: 25

A client with osteoporosis has been cleared for exercise. Which exercise-programming strategies are generally appropriate? Select all that apply.

A. Weight-bearing walking, as tolerated

B. Progressive resistance training with appropriate technique

C. Balance training to reduce fall risk

D. Repeated loaded sit-up exercises

E. Forceful end-range trunk twisting

ANSWER: A B C

Explanation:

Weight-bearing aerobic activity, progressive resistance training emphasizing proper technique, and balance training are appropriate components of an exercise program for many individuals with osteoporosis. These activities can support muscular strength, functional capacity, balance, and skeletal loading while helping reduce fall risk.

Exercises involving repeated loaded spinal flexion or forceful end-range trunk twisting may increase vertebral loading and should generally be avoided or modified, particularly in individuals with vertebral fracture or marked kyphosis. Programming

must be individualized according to fracture history, symptoms, functional ability, and medical guidance. See the Bone Health and Osteoporosis Foundation guidance on exercise and safe movement.

QUESTION NO: 26

Which of the following cardiovascular variables does NOT increase as a result of chronic exercise while performing a single bout of maximal exercise?

A. Maximal HR.

B. Maximal cardiac output.

C. Maximal SV.

D. Maximal oxygen consumption.

ANSWER: A

Explanation:

Maximal HR. is correct because chronic endurance exercise training does not raise the highest heart rate an individual can attain during maximal effort. Maximal heart rate is determined predominantly by age and intrinsic cardiac pacemaker function, and it generally remains unchanged or may be slightly lower after training. In contrast, training substantially improves the heart's ability to eject blood per beat at maximal exercise. This increase in maximal stroke volume, together with cardiovascular adaptations that support greater blood delivery, permits maximal cardiac output to increase. The higher maximal cardiac output contributes importantly to an increase in maximal oxygen consumption, consistent with the Fick principle: oxygen uptake equals cardiac output multiplied by the arterial–venous oxygen difference. Therefore, although exercise training improves performance and many maximal cardiovascular responses, it does not produce an increase in maximal heart rate. This distinction is clinically useful when interpreting exercise-test results and when prescribing training intensities: improvements in aerobic capacity should not be expected to result from a higher maximal heart-rate ceiling. The American College of Sports Medicine describes endurance-training adaptations that include increased maximal stroke volume and cardiac output, while maximal heart rate changes little. See ACSM physical activity resources and the NCBI overview of exercise physiology.

QUESTION NO: 27

What is the relative Yo2 of walking on a treadmill at 3.5 mph and a 10% grade?

A. 181.72mL . kg-1 . min-1

B. 18.17mL. kg-1 . min-1

C. 29.76mL . kg-1 . min-1

D. 27.96mL . kg-1 . min-1

ANSWER: C

Explanation:

The correct relative oxygen uptake is **29.76mL . kg-1 . min-1**. For walking treadmill exercise, the ACSM metabolic equation is: VO_2 ($mL \cdot kg^{-1} \cdot min^{-1}$) = 0.1 × speed + 1.8 × speed × grade + 3.5, where speed is expressed in meters per minute and grade is expressed as a decimal. First, convert 3.5 mph to meters per minute: 3.5 × 26.8 = 93.8 $m \cdot min^{-1}$. The horizontal component is 0.1 × 93.8 = 9.38 $mL \cdot kg^{-1} \cdot min^{-1}$. The vertical component is 1.8 × 93.8 × 0.10 = 16.884 $mL \cdot kg^{-1} \cdot min^{-1}$. Adding the resting component of 3.5 $mL \cdot kg^{-1} \cdot min^{-1}$ gives 9.38 + 16.884 + 3.5 = 29.764 $mL \cdot kg^{-1} \cdot min^{-1}$, which rounds to 29.76 $mL \cdot kg^{-1} \cdot min^{-1}$. This equation is intended for steady-state walking and is appropriate here because the treadmill speed is within the usual walking-equation range. ACSM's exercise-testing standards and professional resources are available through ACSM's Guidelines for Exercise Testing and Prescription; the walking metabolic equation is also summarized by ExRx.net.

QUESTION NO: 28

When compared with leg exercise, arm exercise results in a relatively

A. Increased HR at all intensities.

B. Lower SBP at all intensities.

C. Increased venous return at all intensities.

D. Increased Vo2max.

ANSWER: A

Explanation:

Increased HR at all intensities. is correct. During dynamic arm exercise, the active muscle mass is smaller than during leg exercise, and the arm musculature generally has a lower capacity for sustained oxidative work. At a given external work rate, arm exercise therefore places a comparatively greater cardiovascular demand on the participant. Heart rate rises more for a given workload to help maintain the cardiac output needed to supply the working upper-extremity muscles. This response is relevant when selecting exercise modes and interpreting exercise-test or training data, particularly for people who use arm ergometry or have limited lower-extremity function. Exercise physiology references consistently describe higher heart-rate responses during upper-body work than during lower-body work at comparable absolute workloads, along with important mode-specific differences in oxygen uptake and hemodynamics. ACSM's exercise-testing and prescription resources address the need to account for exercise modality when evaluating cardiovascular responses: ACSM's Guidelines for Exercise Testing and Prescription. A review of cardiovascular responses to arm exercise is available through PubMed.

QUESTION NO: 29

Which fat-soluble vitamin is important for bone formation?

A. Vitamin A.

B. Vitamin D.

C. Vitamin E.

D. Vitamin K.

ANSWER: B

Explanation:

Vitamin D. is the best single answer because it has a central, established role in skeletal mineralization. Vitamin D promotes intestinal absorption of calcium and phosphate, the minerals required to form and maintain properly mineralized bone. When vitamin D availability is inadequate, calcium absorption falls and the body may compensate by increasing parathyroid hormone activity, which can contribute to loss of bone mineral. In children, severe deficiency can impair mineralization of growing bone and cause rickets; in adults, it can cause osteomalacia. These clinical consequences illustrate why adequate vitamin D status is fundamental to bone formation and bone health.

For clinical exercise professionals, this relationship is relevant when recognizing nutritional factors that may affect musculoskeletal health, fracture risk, and an individual's capacity to participate safely in weight-bearing activity. Vitamin D is obtained through skin synthesis after ultraviolet-B exposure, certain foods, fortified foods, and supplements when indicated. The National Institutes of Health notes that vitamin D supports calcium absorption and is needed for bone growth and remodeling. The National Academies' Dietary Reference Intakes likewise identify vitamin D as essential for calcium metabolism and bone health. See the NIH Office of Dietary Supplements vitamin D fact sheet and the National Academies reference intake report for calcium and vitamin D.

QUESTION NO: 30

Fiber is a type of carbohydrate that is not digestible (e.g., it will pass through the digestive system without being absorbed). The NCEP ATPIII guidelines recommend that soluble (viscous) fiber be included in the diet for the prevention and treatment of elevated blood lipid concentrations.

Sources of soluble (viscous) fibers include

A. Fruits, beans, and oats.

B. Meat and dairy foods.

C. Wheat bran and whole wheat products.

D. All of the above.

ANSWER: A

Explanation:

Fruits, beans, and oats are established dietary sources of soluble, viscous fiber. Soluble fibers dissolve or swell in water to form a viscous gel within the gastrointestinal tract. This viscosity can reduce intestinal cholesterol absorption and increase bile-acid excretion; the liver then uses circulating cholesterol to replace bile acids, supporting a reduction in LDL cholesterol as part of an overall heart-healthy dietary pattern. Oats supply beta-glucan, a particularly well-studied viscous fiber, while legumes such as beans provide soluble fiber along with plant protein and other cardioprotective nutrients. Many fruits contribute pectin and related soluble fiber fractions. ATP III specifically identifies foods such as oats, beans, peas, and certain fruits as practical ways to increase viscous fiber intake, and its Therapeutic Lifestyle Changes approach includes adding 5–10 g/day of viscous fiber to help lower LDL cholesterol. In clinical exercise physiology practice, this recommendation is appropriately integrated with dietary pattern counseling, physical activity, weight management where indicated, and medical nutrition therapy or pharmacotherapy when clinically necessary. See the NHLBI ATP III Executive Summary and the National Lipid Association's evidence-based nutrition recommendations.

QUESTION NO: 31

Which of the following manifestations would be an indication for stopping an exercise test?

A. Low cholesterol «125 mol).

B. Diastolic BP greater than 105 mm Hg.

C. Intermittent premature ventricular contractions.

D. Low blood sugar «100 mg/dL).

E. Diastolic BP greater than 115 mm Hg.

ANSWER: E

Explanation:

Diastolic BP greater than 115 mm Hg is an ACSM relative indication for terminating an exercise test. A markedly elevated diastolic pressure during progressively intense exercise can reflect an excessive hypertensive response and raises concern for acute cardiovascular risk. When this threshold is reached, the exercise professional should stop the test, begin an appropriate recovery and monitoring period, reassess blood pressure, and follow the facility's emergency and medical-referral procedures as clinically indicated. Termination decisions are never based solely on a number in isolation: symptoms, ECG findings, systolic blood-pressure behavior, the participant's clinical history, and the supervising clinician's judgment remain essential. However, a diastolic pressure exceeding 115 mm Hg is a recognized threshold that warrants stopping rather than continuing to higher workloads. ACSM's exercise-testing guidance lists exaggerated hypertensive responses among the relative indications for test termination, allowing clinical judgment while prioritizing participant safety. See ACSM's Guidelines for Exercise Testing and Prescription and the American Heart Association's scientific statement on exercise testing at PubMed.

QUESTION NO: 32

Which of the following strategies can help a person to maintain his or her physical activity?

A. Schedule check-in appointments.

B. Reduce barriers.

C. Increase benefits.

D. Educate regarding different types of exercise.

E. All of the above.

ANSWER: E

Explanation:

“All of the above.” is correct because long-term physical-activity maintenance is best supported through a combination of behavioral and practical strategies rather than a single intervention. Scheduling check-in appointments provides ongoing accountability, monitoring, feedback, and opportunities to revise goals as circumstances change. Reducing barriers—such as lack of time, limited access, transportation challenges, cost, or uncertainty about how to exercise—makes regular activity more feasible. Increasing the perceived and experienced benefits of activity can strengthen motivation by helping the person connect exercise with personally meaningful outcomes, such as improved function, energy, mood, or health. Education about different exercise types helps individuals select safe, enjoyable, accessible activities and vary their program when needed, which supports continued participation. This combined approach aligns with physical-activity guidance emphasizing behavior-change supports, self-monitoring, goal setting, social support, and addressing barriers to sustained activity. The U.S. Department of Health and Human Services discusses these evidence-based approaches in its Physical Activity Guidelines for Americans, 2nd edition. ACSM also highlights the importance of individualized exercise programming and adherence-focused support in its Guidelines for Exercise Testing and Prescription.