ANZSRS
Australian and New Zealand Society of Respiratory Science Ltd ACN 147 665 763
Leading Respiratory Science in Australasia

CRFS EXAMINATION
Practice Exam Created 01/2023

IMPORTANT POINTS TO REMEMBER

1. Unless otherwise stated, laboratory values are reported at sea level with barometric pressure (P_B) equal to 760 mmHg.

2. The term "ATS/ERS recommendations" used in some questions refers to information on respiratory function testing as presented in current position papers published by the American Thoracic Society (ATS) and European Respiratory Society (ERS). The respiratory terms and symbols used in the examination are from the American College of Chest Physicians (ACCP) and ATS recommendations on pulmonary nomenclature.

3. An ATPS to BTPS conversion table is provided on the next page.

GENERAL INSTRUCTIONS

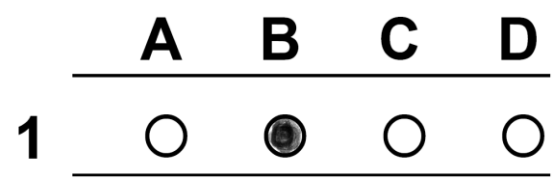
1. You will be given 2 hours to complete the examination, which consists of 100 multiple-choice questions.

2. Your mark is based on the number of questions you answer correctly. YOU ARE ASKED TO INDICATE YOUR ANSWERS TO ALL QUESTIONS ON THE SEPARATE ANSWER SHEET PROVIDED. Although you may make preliminary notes or calculations in the examination book, no credit will be given for anything written in the examination book. The answer spaces are lettered to correspond with the letters of the suggested answers to the questions in this book. After you have decided which of the suggested answers is correct, blacken the corresponding space on the answer sheet. **Give only one answer to each question**. If you change an answer, be sure that the previous mark is **erased completely**. **USE ONLY A BLACK LEAD PENCIL, PREFERABLY 2B, AND BE SURE THAT EACH MARK IS BLACK AND COMPLETELY FILLS THE ANSWER SPACE.**

Enter last name and first initial and Candidate ID number as in space provided
Example Answer

Which of the following is the capital of New Zealand?

- Auckland
- Wellington
- Christchurch
- Dunedin



Directions: Four suggested answers or completions follow each of the questions or incomplete statements. **Select the one that is best in each case and then blacken the corresponding space on the answer sheet.**

DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO DO SO.

CRFS EXAMINATION

Time: 2 hours

Note: Refer to the ATPS to BTPS Conversion Table below as necessary.

ATPS to BTPS Conversion Table

Temperature (˚C)	Conversion Factor
20	1.102
21	1.096
22	1.091
23	1.085
24	1.080
25	1.075
26	1.068
27	1.063
28	1.057
29	1.051
30	1.045

Constants

Universal Gas Constant (R)	8.314	$J\ K^{-1}\ mol^{-1}$		
Avogadro's number	6.022×10^{23}	mol^{-1}		
Atmospheric Pressure	101.3	kPa	760	mmHg
Saturated water vapour Pressure at 37°C (P_{H_2O})	6.28	kPa	47.1	mmHg

Gas Molar Masses

H_2	–	2.02	$g\ mol^{-1}$
He	–	4.00	$g\ mol^{-1}$
CH_4	–	16.04	$g\ mol^{-1}$
CO	–	28.01	$g\ mol^{-1}$
N_2	–	28.02	$g\ mol^{-1}$
O_2	–	32.00	$g\ mol^{-1}$
CO_2	–	44.01	$g\ mol^{-1}$
SF_6	–	146.06	$g\ mol^{-1}$

1 Most of the resistance to airflow in the tracheobronchial tree is in the:

A - Alveoli
B - Peripheral airways
C - Central airways
D - Terminal respiratory bronchioles

2 The diffusion pathway in the lung is normally about:

A - 0.1 to 0.5 µm
B - 1.0 to 5.0 µm
C - 0.1 to 5.0 µm
D - 5.0 to 10.0 µm

3 The motor nerve innervating the diaphragm is the:

A - Abducent
B - Phrenic
C - Tympanic
D - Vestibular

4 Name the region of the pharynx that extends from the soft palate to the epiglottis:

A - hypopharynx
B - oropharynx
C - laryngopharynx
D - nasopharynx

5 Which of the following is correct about pulmonary circulation:

A - Oxygen-rich blood travels from the right ventricle to the aorta
B - Oxygen-poor blood travels from the left ventricle to the pulmonary artery
C - Oxygen-poor blood travels through the pulmonary vein
D - Oxygen-poor blood travels from the right ventricle to the pulmonary artery

6 The right & left bronchus along with the pulmonary artery & vein enter into the lungs at the?

A - Hilum
B - Carina
C - Alveolar ducts
D - Right middle lobe

7 The valve between the right ventricle and the pulmonary artery is the:

A - Tricuspid valve
B - Aortic valve
C - Pulmonary valve
D - Mitral valve

8 What is the main function of the erthyocytes?

A - Responsible for transport of O_2/CO_2 between the body's tissue and lungs
B - Secrete pulmonary surfactant
C - To fight infection
D - Plasma membrane of the erthyocyte

9 The protruding structure known commonly as the Adam's apple is the:

A - epiglottis
B - thyroid
C - trachea
D - larynx

10 Which statement may be used to define a bronchiole

A - their walls contain smooth muscle but no cartilage.
B - they are the airways that branch from the left and right primary bronchi.
C - they are kept open by "C" shaped rings of cartilage.
D - their walls have supporting cartilage between smooth muscle.

11 The acinus does NOT contain:

A - Respiratory bronchioles
B - Terminal bronchioles
C - Alveolar ducts
D - Alveolar sacs

12 Airway generations 0 to 16 are known as the:

A - Transition zone
B - Alveolar zone
C - Conducting zone
D - Respiratory zone

13 What is the structure located between the two pleural sacs and is the central component of the thoracic cavity:

A - Ribcage
B - Mediastinum
C - Diaphragm
D - Hilum

14 Bony ridges on the lateral walls of the nasal cavity that increase surface area are known as:

A - conchae
B - nostrils
C - nares
D - nasal septa

15 The microscopic hairs that prevent foreign materials from entering your lungs are known as:

A - vellus
B - bronchus
C - cilia
D - lanugo

16 The primary cause of airflow limitation in patients with emphysema is:

A - Loss of lung elastic recoil
B - Bronchospasm
C - Thickening of the airway walls
D - Decreased compliance

17 A young, previously healthy patient has the arterial blood gas results below: On the basis of this information, it would be most appropriate to conclude that the patient

pH	7.15	
P_{aCO_2}	75	mmHg
P_{aO_2}	70	mmHg
HCO_3	25	mEq L^{-1}

A - Is hypoperfusing
B - Has a respiratory acidosis
C - Has a metabolic acidosis
D - Is severely hypoxaemia

18 During quiet breathing, at the start of inspiration the intrapleural pressure is about -4 cmH_2O (relative to atmospheric pressure). As inspiration proceeds, intrapleural pressure reaches approximately:

A - -8 cmH_2O
B - +1 cmH_2O
C - -1 cmH_2O
D - +6 cmH_2O

19 In the upright position, the perfusion of the lung is:

A - Greatest in the apical regions
B - Greatest in the basal regions
C - Inversely related to alveolar ventilation
D - Uniform throughout the lung

20 Which of the following formulas is correct?

A - VC = IRV + VT
B - VA = Respiratory Rate x (VT - VD)
C - VC = IRV + ERV
D - IRV = VC – VT

21 Which statement best describes the relationship between the pH of blood and its oxygen carrying capacity at a given P_{O_2}?

A - The oxygen carrying capacity of blood at pH 7.0 is greater than at pH 7.4
B - The oxygen carrying capacity of blood at pH 7.0 and at pH 7.4 are equal.
C - pH affects only the position of the oxyhaemoglobin dissociation curve, not the oxygen content of blood
D - The oxygen carrying capacity of blood at pH 7.4 is greater than at pH 7.0

22 In a standing normal individual, the unevenness of pulmonary blood flow from the lung apex to the base results mainly from:

A - Pulmonary capillary anatomy
B - Gravity
C - Ventilation distribution
D - Pleural pressure gradient

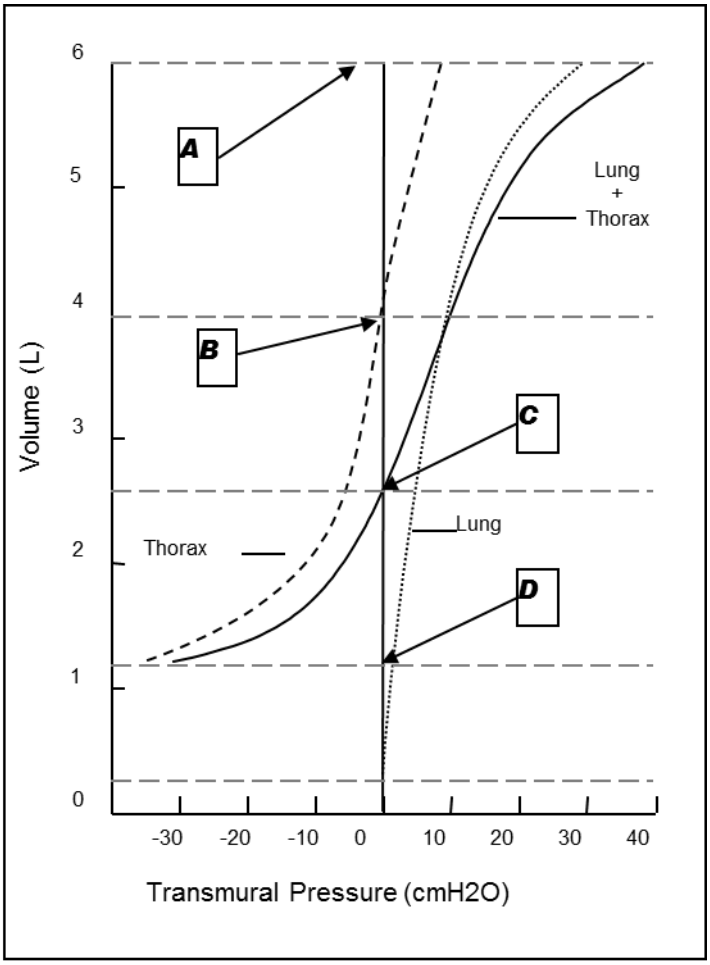
23 Hyperventilation may be defined as:

A - A minute ventilation that causes a decrease in $P_{a_{CO_2}}$
B - A minute ventilation greater than 10 L min^{-1}
C - Respiratory rate greater than 30 breaths min^{-1}
D - All of the above

24 According to the Bronsted-Lowry theory an acid is a compound that

A - Releases H^+ when it dissociates
B - Releases OH^- when it dissociates
C - Combines with H^+
D - Increases the pH of the solution

25 In the figure provided which arrow indicates functional residual capacity



26 The therapeutic use of oxygen may aid in accomplishing which of the following?

1. decrease the work of breathing
2. decrease myocardial work
3. prevent ARDS
4. increase the patient's respiratory rate

A - 1 and 2
B - 1 and 4
C - 2 and 3
D - 1, 2, 3 and 4

27 The mechanism responsible for transporting the greatest amount of CO_2 in the blood is:

A - Bicarbonate
B - Carbamino compounds
C - Dissolved CO_2
D - Carboxyhaemoglobin

28 Lung surfactant

A - Facilitates CO_2 diffusion through alveolar membranes
B - Facilitates O_2 diffusion through alveolar membranes
C - Increases surface tension of the alveolar membrane
D - Decreases the likelihood of alveolar collapse during expiration

29 Pulmonary compliance is increased in:

A - Pulmonary edema
B - Sarcoidosis
C - kyphoscoliosis
D - Emphysema

30 Administration of 100% O_2 will improve hypoxaemia that is caused by all the following EXCEPT

A - Poliomyelitis
B - Right to left shunt
C - Bronchial obstruction by tumor
D - Interstitial pneumonia

31 Functional Residual Capacity contains:

A - Expiratory reserve volume and residual volume
B - Inspiratory reserve volume and tidal volume
C - Vital capacity and residual volume
D - Tidal volume and residual volume

32 Given the following what is the VD/VT ratio:

Barometric pressure 747 mmHg
$P_{a_{CO_2}}$ = 40 mmHg
$\dot{V}_{CO_2}$ = 240 mL min^{-1}
$\dot{V}_E$ = 6 L min^{-1}
Breathing Frequency =12 min^{-1}

A - .35
B - .30
C - .28
D - .32

33 A patient's arterial blood gas results are below:

pH	7.49
P_{aCO_2}	46 mmHg
P_{aO_2}	70 mmHg
HCO_3^-	34 mmol L^{-1}
BE	11 mmol L^{-1}

A - Compensated metabolic acidosis
B - Uncompensated metabolic alkalosis
C - Partially compensated metabolic alkalosis
D - Compensated respiratory acidosis

34 Transport of O2 by the blood is facilitated by

A - Haemoglobin
B - The poor solubility of nitrogen in water
C - Active transport of O2 into the red cells
D - Carbonic anhydrase in serum

35 What volume would the lung be at if the elastic recoil pressure of the lung and the recoil pressure of the thorax were equal and opposite?

A - Total Lung Capacity
B - Functional Residual Capacity
C - Residual Volume
D - Minimum Lung Volume

36 The medullary respiratory centre is most sensitive to which parameter of the cerebrospinal fluid?

A - P_{CO_2}
B - P_{O_2}
C - PH
D - Bicarbonate ion

37 The residual volume of the lungs:

A - Is the volume of air that remains in the lungs after expiring the resting tidal volume of air
B - Increases in atelectasis
C - Is less than 750 mL in the adult
D - Is generally greater at age 75 than at age 45

38 The static recoil pressure of an air-filled lung is greater during:

A - Inflation than deflation
B - Zero air than airflow
C - Airflow than zero flow
D - Deflation than inflation

39 Compared to the rate of diffusion of oxygen, the rate of diffusion of CO_2 across the alveolar-capillary membrane is:

A - 2 times greater
B - 20 times greater
C - 210 times greater
D - The same

40 Which of the following should increase the P50 of the oxyhaemoglobin dissociation curve?

A - Acidosis
B - Hypercapnia
C - Increased blood levels of 2, 3 - DPG
D - All of the above

41 A mercury (Hg) barometer is approximately 1 m tall, the density of Hg is approximately 13.5 times that of water. To build a water barometer it would have to be how tall?

A - 13.5m
B - 2m
C - 6.25m
D - 1m

42 A patient's vital capacity measured in a spirometer at ambient temperature (24° C) pressure saturated (ATPS) is 3.00L. When adjusted to BTPS conditions, the corrected vital capacity is approximately:

A - 3.45 L
B - 2.85 L
C - 2.70 L
D - 3.25 L

43 A sample of gas at 80 kPa has a volume of 30 L. What will its volume be, at constant temperature, at a pressure of 20 kPa?

A - 60 L
B - 120 L
C - 48 L
D - 80 L

44 Which of the following best describes Gay-Lussac's law

A - The pressure of a fixed amount of a gas at fixed volume is directly proportional to the gas' absolute temperature.
B - The volume occupied by an ideal gas is proportional to the number of moles at fixed temperature and pressure.
C - The volume of a fixed amount of a gas at fixed pressure is directly proportional to its temperature.
D - The total pressure of a mixture of gases or vapours is equal to the sum of the partial pressures of its components

45 A dry calibration gas is 20.1% O_2, 4.5% CO_2 and balance N_2. If this gas is then saturated with water vapour in an environment heated to 37°C what will be the PO_2 if the barometric pressure is 755 mmHg.

A - 142.3 mmHg
B - 134.0 mmHg
C - 151.8 mmHg
D - 153 mmHg

46 To calculate temperature in Kelvin using the ideal gas law, what variables must be known?

A - Number of moles and pressure
B - Volume and number of moles
C - Volume, number of moles and pressure
D - Volume and pressure

47 At sea level the boiling point of any liquid is when its vapour pressure is

A - 101.3 kPa
B - 50 kPa
C - 150 kPa
D - 202.6 kPa

48 At an altitude of 3000 metres (barometric pressure = 523 mmHg) the P_{O_2} of the air would be approximately:

A - 110 mmHg
B - 21 mmHg
C - 159 mmHg
D - 88 mmHg

49 A CO_2 analyser, to be used for expired breath analysis, is calibrated using a 5.00% CO_2 mixture with a water vapour absorber in the sample line. If the barometric pressure is 747 mmHg and the analyser is set to read partial pressure, the analyser should be adjusted to read which of the following?

A - 37 mmHg
B - 31 mmHg
C - 40 mmHg
D - 35 mmHg

50 In a measurement of FRC by helium dilution, the original and final He concentrations were 10 and 6% respectively and the spirometer volume was maintained at 5.0L. What was the volume of the FRC (ATP)?

A - 3.0 L
B - 3.3 L
C - 3.6 L
D - 4.0 L

51 When setting up a system for measuring helium dilution FRC using a He analyser, which of the following components MUST be used?

1 - water absorber
2 - CO_2 absorber
3 - O_2 analyser
4 - CO_2 analyser

A - 2 and 4
B - 1 and 2
C - 3 and 4
D - 2 only

52 What is the main purpose of a regulator on a gas cylinder?

A - Decrease cylinder or supply pressure to a fixed pressure
B - To ensure the gas complies with regulations
C - To reduce fire risk
D - To monitor the amount of gas released

53 Which of the following problems can faulty electrical equipment cause?

A - Electrical shock
B - Fire
C - Explosion
D - All of the above

54 Why should one wait 10-15 minutes after a helium dilution test before repeating it on a patient?

A - all the He must be cleared from the patient's lungs
B - all He must be cleared from the spirometer and the meter
C - a build-up of He in the lungs could be toxic
D - the patient must return to normal O_2 consumption

55 During determination of FRC by the helium dilution method, if the patient was turned into the circuit before the end of a normal expiration, the amount of switching error will be:

A - subtracted from the final calculation of FRC
B - added to the final calculation of FRC
C - ignored
D - multiplied by barometric pressure and added to the final

56 What is the primary reason why water has to be removed from gas prior to analysis in an infrared carbon dioxide analyser?

A - Water can alter the thermal conductivity of the gas mixture altering the measurement
B - Water can absorb infrared light and can therefore interfere with accurate measurement
C - Water causes blockages in the sample line
D - Water can cause corrosion of the analyser

57 A computer using an 8 bit analogue to digital converter is set for a voltage range of 0 to 10 volts. If it is attached to a spirometer that produces 1 volt for every 2 L of volume displacement, what is the smallest volume increment which the converter can detect?

A - 80 mL
B - 60 mL
C - 20 mL
D - 40 mL

58 To interface a differential pressure pneumotachometer to a computer, which of the following devices are required?

1 - pressure transducer with amplifier
2 - linear potentiometer
3 - A/D convertor
4 - D/A convertor

A - 1 and 3 only
B - 1, 2, 3 and 4
C - 2 and 3 only
D - 2 and 4 only

59 With respect to the Westgard rules applied to quality control which of the following would NOT demonstrate an out of control condition.

1. 1 control measurement > mean+ 3 SDs
2. 1 control measurement < mean- 2 SDs
3. 2 control measurements are both <mean-2 SDs
4. 3 control measurements trend in the same direction (T3)

A - 1
B - 4
C - 2
D - 3

60 During repeated FVC manoeuvres using an unheated Fleisch pneumotach the recorded dynamic volumes are observed to progressively increase. The most likely explanation for this observation is:

A - the subject is getting better at performing the manoeuvres with each successive attempt
B - condensation on the resistive elements of the pneumotach is increasing it's resistance and therefore overestimating the measured flow
C - there is excessive noise in the flow signal
D - the pressure transducers are drifting

61 Which of the following analysing devices has a calibration point of zero mmHg on room air?

A - Clark electrode
B - capnography analyser
C - nitrogen analyser
D - oxygen analyser

62 Carbon monoxide transfer factor will be decreased in emphysema because of:

A - thickening of alveolar walls
B - alveolar-capillary block
C - decrease in capillary blood flow
D - decrease in surface area of functioning alveoli

63 Which of these groups of drugs is used for asthma treatment?

A - β-2 - antagonists
B - Methylxanthines
C - Muscarinic agonists
D - All of above

64 During an aerosolised bronchodilator treatment, the patient complains of dizziness and tingling of the extremities. The respiratory scientist should ask the patient to do which of the following?

A - Cough deeply
B - Perform a Mueller manoeuvre
C - Performed pursed-lip breathing
D - Take slow breaths

65 Salbutamol:

A - Is a sympathomimetic bronchodilator
B - Has a potent effect on cardiac function
C - Has the quickest onset of action of all bronchodilators
D - Is a bronchodilator of smooth muscle with the same duration of action as isoproterenol

66 Which of the following is a disadvantage to spacer use for inhaled drug delivery

A - Propellant may evaporate
B - Spacers can filter out larger aerosol particles
C - Aerosol cloud velocity may decrease
D - Electrostatic charge may reduce the respirable aerosol fraction

67 Which of the following is NOT a mechanism for aerosol deposition in the lung

A - Rotational inertia
B - Impaction
C - Sedimentation
D - Brownian Movement

68 When teaching correct metered dose inhaler technique, patients are instructed to hold their breath at the end of inspiration as this will enhance:

A - Venous return
B - Particle stability
C - Medication delivery
D - Ciliary action

69 A baffle is used on a nebuliser to:

A - entrain room air
B - break the aerosol into smaller particles
C - to return oversized aerosol particles to reservoir
D - heat the gas above room temperature

70 The results of a patient's lung volume study are below: Which of the following observed results should be recalculated?

	Predicted	Observed
VC (L)	3.00	3.27
FRC (L)	2.55	2.00
IC (L)	1.82	2.42
ERV (L)	1.18	0.85
RV (L)	1.37	1.15
TLC (L)	4.37	5.43
RV/TLC (%)	31	21

A - TLC and RV/TLC
B - RV, TLC AND RV/TLC
C - None
D - TLC only

71 In reviewing an expiratory flow-volume curve, the respiratory scientist should use which of the following to evaluate the degree of patient effort?

A - FEF_{50}
B - $FEF_{200-1200}$
C - PEF
D - FEF_{25}

72 The following may precipitate acute asthma;

A - exercise
B - aspirin
C - respiratory infection
D - all of the above

73 Which of the following values should be reported for PEF?

	FVC L	FEV_1 L	PEF L s^{-1}
Trial 1	5.46	4.55	8.8
Trial 2	5.2	4.9	4.7
Trial 3	5.45	4.6	9.4
Trial 4	5.38	4.61	10

A - 10.0 L s^{-1}
B - 4.7 L s^{-1}
C - 9.4 L s^{-1}
D - 8.8 L s^{-1}

74 A rolling seal spirometer is preventing a patient from completely exhaling during a forced vital capacity manoeuvre. The most likely cause for this is;

A - The rolling seal is not at the appropriate position prior to the patient going onto the mouthpiece
B - The encoder is sticking.
C - There is a leak in the tube.
D - The seal has a leak in it.

75 A morbidly obese patient (mass >150kg) requires measurement of static volumes. What is the most appropriate action a laboratory can take to accurately measure TLC?

A - Perform static volumes using conservation of mass technique, i.e. He dilution or N_2 washout.
B - Estimate TLC from VA measured during gas transfer assessment.
C - Estimate TLC from a slow vital capacity manoeuvre.
D - Find a laboratory that has a bariatric whole body plethysmograph.

76 According to ATS/ERS standards, the minimum number of acceptable FVC manoeuvres to be performed is which of the following?

A - 4
B - 5
C - 3
D - 2

77 A whole body plethysmograph is exhibiting a highly variable leak time during a leak test. The most likely reason for this is;

A - There is excessive airflow around the box due to air conditioner.
B - The leak valve needs to be adjusted.
C - The door seal is damaged or contaminated.
D - The pressure sensor is faulty.

78 A patient is having difficulty performing spirometry on a rolling seal spirometer. They are on their 6th attempt and after a short time (whilst establishing FRC) they come off the spirometer complaining of a headache and increasing breathlessness. The most likely cause for this is;

A - The patient is hyperventing.
B - The spirometer has not been flushed between manouvres and carbon dioxide is accumulating in the spirometer.
C - The patient is experiencing bronchospasm.
D - The spirometer has a leak in it.

79 According to ATS/ERS position statement in which position should spirometry normally be performed unless otherwise stated?

A - Lying
B - Standing
C - Seated
D - Seated or standing

80 A patient who smokes has a CO-Hb of 12% and a $T_{L_{CO}}$ of 12; if the observed $T_{L_{CO}}$ value were adjusted for the increased CO-Hb level, the corrected $T_{L_{CO}}$ would be:

A - The same
B - Cannot be determined without Hb concentration
C - Slightly higher
D - Slightly lower

81 While breathing CO in 40% oxygen compared to breathing CO in 21% oxygen, the calculated carbon monoxide diffusing capacity will?

A - Fall
B - Remain unchanged
C - $T_{L_{CO}}$ cannot be measured at O_2 concentrations greater than 21%
D - Rise

82 Which of the following is not a relative contraindication for spirometry

A - Brain surgery within 4 week
B - Cigarette smoking <30 min
C - Clinically unstable pulmonary embolism
D - Eye surgery within 1 week

83 Which of the following would most likely prolong He equilibration time?

A - Emphysema
B - Pneumonia
C - Sarcoidosis
D - Obesity

84 A pre-bronchodilator expiratory flow-volume curve is attempted by a patient who cannot control his cough. An approximation of the curve may be obtained by instructing the patient to do which of the following?

A - Take a full breath, then expel the air forcefully despite coughing
B - Do a forced inspiration first, then a normal expiration
C - Breathe in partially, then blow out slowly.
D - Blow out forcefully, through pressed lips

85 Why is it important to stress the slow exhalation of air on volume studies such as the VC and ERV.

A - It ensures that the recording pen will accurately follow the
B - Obstructed patients may trap gas if exhalation is fast
C - Pneumothorax is prevented
D - It is less strenuous on the patient

86 Which of the following is indicated if peak flows of 4.2, 5.6 and 4.8 L s^{-1} are obtained from a patient?

A - Inconsistent patient effort
B - Chronic restrictive lung disease
C - Severe upper airway obstruction
D - Normal peak expiratory flows

87 Regarding the single breath $T_{L_{CO}}$ test, the fractional concentration of CO at the beginning of breath holding ($F_{A_{CO}}$) is determined by which of the following?

A - ($F_{A_{He}}$ / $F_{I_{He}}$) x $F_{I_{CO}}$
B - Volume inspired divided by $F_{A_{He}}$ / $F_{I_{He}}$
C - Estimation of the ratio $F_{A_{He}}$ / $F_{I_{He}}$
D - Measurement of CO from an alveolar sample

88 In which of the following conditions might respiratory function testing be contraindicated?

A - Bronchiolitis obliterans
B - Vocal cord paralysis
C - Tension pneumothorax
D - Congestive heart failure

89 Which of the following is **NOT** a relative contraindication for spirometry

A - Vaping <1hour prior to testing
B - Cerebral aneurysm
C - Late-term pregnancy
D - Severe hypertension

90 A 22 year old pre-operative patient with no history of obstructive lung disease has a vital capacity of 4.6 L and FVC of 3.2 L. The most probable cause for the difference in these data is

A - Poor patient effort on the FVC
B - Restrictive lung disease
C - Lung consolidation
D - Hyperventilation before surgery

91 Pulmonary function tests in an obese patient will most commonly show:

A - A reduced ERV
B - An increased FRC
C - An increased IRV
D - A reduced FEF_{25-75}

92 Which of the following is a pathological change common to asthma?

A - Dilation of bronchial smooth muscle
B - Destruction of alveolar septa
C - Destruction of pulmonary capillaries
D - Epithelial desquamation

93 An adult complains of chest tightness and cough when he jogs in cold weather. These symptoms are consistent with which of the following?

A - Idiopathic pulmonary fibrosis
B - Cystic fibrosis
C - Asthma
D - Pulmonary hypertension

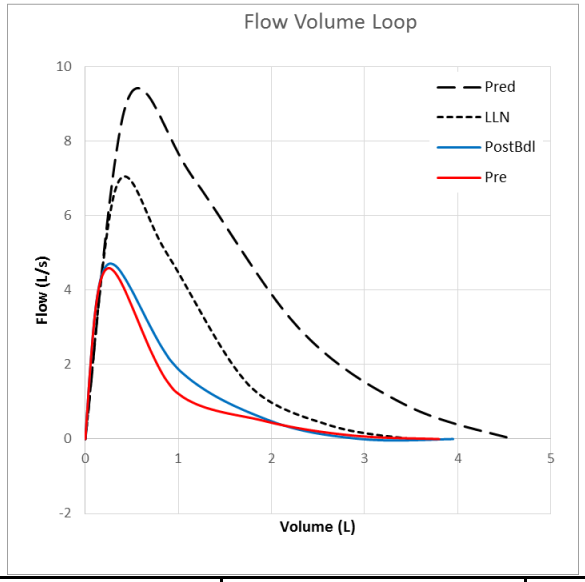
94 The gas transfer (T_{LCO}) of the lung is usually markedly increased in:

A - Emphysema
B - Intrapulmonary haemorrhage
C - Asthma
D - Cryptogenic fibrosing alveolitis

95 Which of the following diseases is usually associated with a restrictive pattern?

A - Kyphoscoliosis
B - Asthma
C - Emphysema
D - Bronchiolitis

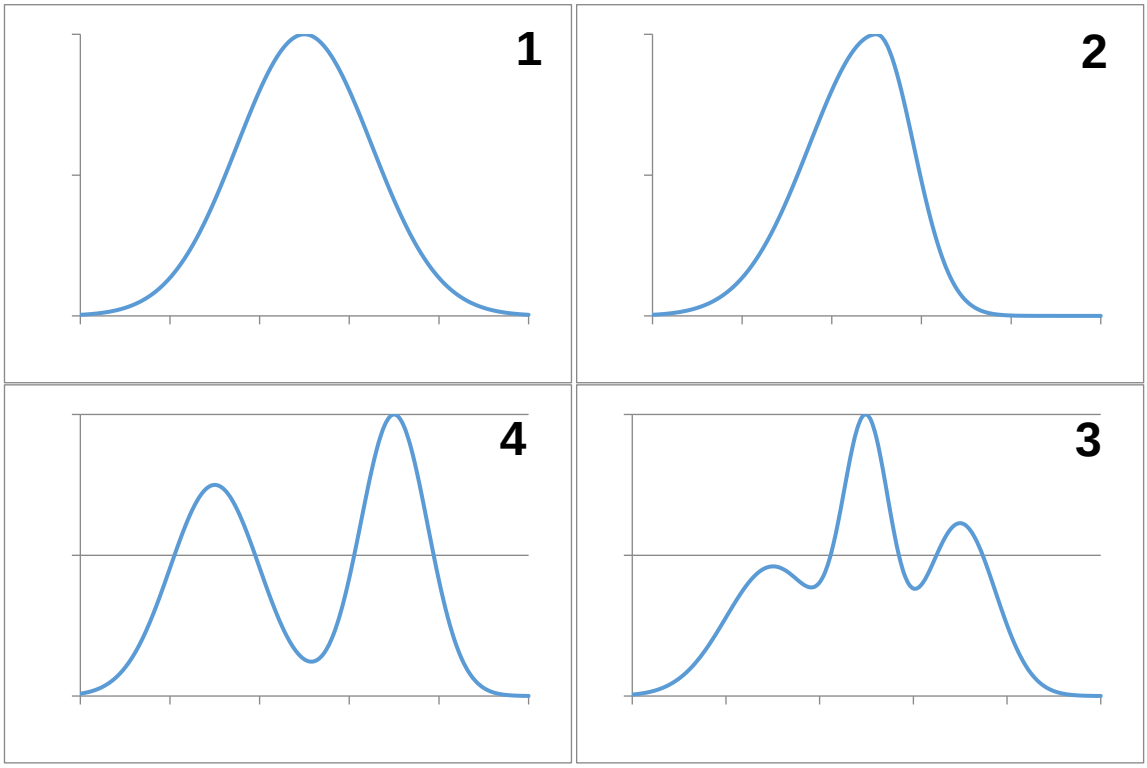
96 The following results are most consistent with:



				Pre Bronchodilator			Post Bronchodilator			
Measure	**Unit**	**Pred**	**LLN**	**Meas**	**%Pred**	**Z-score**	**Meas Post Bdl**	**%Δ Post Bdl**	**%Pred Post Bdl**	**Z-score Post Bdl**
PEF	L/s	9.15	6.86	4.60	50	-3.26	4.70	2.2	51	-3.19
FEV1	L	3.55	2.68	1.62	46	-3.47	1.60	-1.2	45	-3.50
FVC	L	4.59	3.50	3.80	83	-1.19	3.95	3.9	86	-0.97
FEV1FVC	L/s	0.78	0.66	0.43	55	-4.05	0.41	-5.0	52	-4.22
FEF2575	L/s	2.97	1.46	0.50	17	-3.25	0.50	0.0	17	-3.25
TLCO	mmol/min/kPa	9.11	6.83	4.00	44	-4.25				
KCO	mmol/min/kPa/L	1.42	1.07	0.72	51	-3.54				
VA	L	6.46	5.22	5.50	85	-1.26				

A - COPD
B - Elevated hemidiaphragm
C - Pulmonary fibrosis
D - Asthma

97 Which figure represents a normal distribution



A - 3
B - 4
C - 1
D - 2

98 Correct conclusions about a 180cm, 40 years old male subject who has an FEV1/FVC ratio of 65% include which of the following?

1 - his FEV_1/FVC ratio is below normal
2 - he has obstructive lung disease
3 - he has restrictive lung disease
4 - he has a diffusion impairment

A - 3 only
B - 1, 2 and 4
C - 1 and 2
D - 1 only

99 A patient's flow-volume loop displays a marked decrease in inspiratory flow, with slightly decreased expiratory flow. The most probable explanation is:

A - Small airways disease
B - Restrictive lung disease
C - Vocal cord paralysis
D - Intrathoracic tracheal tumour

100 In a normal adult, peak expiratory flow is PRIMARILY dependent upon

A - Patient effort
B - Lung compliance
C - Patient position
D - Chest wall compliance

7

End of Exam

A
17

A N Z S R S - CRFS Exam Practice- Compiled 2023-01

ANSWER SHEET

1	C	26	A	51	B	76	C
2	A	27	A	52	A	77	C
3	B	28	D	53	D	78	B
4	B	29	D	54	A	79	C
5	D	30	B	55	A	80	C
6	A	31	A	56	B	81	A
7	C	32	B	57	A	82	B
8	A	33	C	58	A	83	A
9	D	34	A	59	B	84	A
10	A	35	B	60	B	85	B
11	B	36	C	61	B	86	A
12	C	37	D	62	D	87	A
13	B	38	A	63	B	88	C
14	A	39	B	64	D	89	A
15	C	40	D	65	A	90	A
16	A	41	A	66	D	91	A
17	B	42	D	67	A	92	D
18	A	43	B	68	C	93	C
19	B	44	A	69	C	94	B
20	B	45	A	70	A	95	A
21	D	46	C	71	C	96	A
22	B	47	A	72	A	97	C
23	A	48	A	73	A	98	C
24	A	49	D	74	A	99	C
25	C	50	B	75	A	100	A