

B.Sc. RESPIRATORY THERAPY
THIRD YEAR
PAPER I – RESPIRATORY THERAPY TECHNIQUES - I
Q.P. Code: 802616

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x 10 = 30)

1. Define acute respiratory failure. How will you differentiate type I and hypercapnic respiratory failure? Discuss different causes of respiratory failure.
2. Classify ventilators and describe how they work?
3. What are the different alarms in a mechanical ventilator? How will you trouble shoot each of them?

II. Write Notes on:

(8 x 5 = 40)

1. What are the indications of non-invasive ventilation in chronic obstructive pulmonary disease?
2. Discuss the detrimental effects of inappropriate Positive End Expiratory Pressure during mechanical ventilation.
3. Discuss patient positioning during mechanical ventilation.
4. Describe Automatic tube compensation.
5. Explain the ventilatory strategy for a patient with raised intracranial pressure.
6. Describe negative pressure ventilation.
7. Describe the risk factors for nosocomial pneumonia.
8. Describe the techniques for minimizing effects of auto-PEEP (Positive End Expiratory Pressure).

III. Short Answers on:

(10 x 3 = 30)

1. Clinical presentation of decreased ventilatory drive.
2. Discuss the various cycle variables of a ventilator.
3. Discuss Pressure Support Ventilation.
4. What are the physiologic goals of ventilatory support?
5. What are the differences between pressure-control and volume-control ventilation?
6. Explain the importance of adjusting trigger sensitivity during mechanical ventilation.
7. What are the predictors of success during non-invasive positive pressure ventilation in acute care setting?
8. Describe rapid shallow breathing index.
9. Enumerate the various factors that may reduce ventilator drive during mechanical ventilation.
10. Describe cuff leak test.

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Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on: **(3 x 10 = 30)**

1. Describe advantages and disadvantages of non-invasive ventilation.
2. Discuss the effects of mechanical ventilation of oxygenation and ventilation.
3. A patient on invasive mechanical ventilation developed sudden distress with drop in oxygen saturation. How will you approach this situation?

II. Write Notes on: **(8 x 5 = 40)**

1. Explain ventilation perfusion matching in normal and diseased state.
2. Describe the control variables of a ventilator.
3. Describe the beneficial effects of appropriate PEEP (Positive End Expiratory Pressure).
4. Describe Adaptive Servo ventilation.
5. What are the cardiovascular effects of positive pressure mechanical ventilation?
6. What are the complications related to positive pressure ventilation?
7. What are the advantages and disadvantages of Pressure Control Ventilation?
8. Describe the various modes of invasive ventilation.

III. Short Answers on: **(10 x 3 = 30)**

1. How will you differentiate Type I and Type II respiratory failure?
2. Describe the mandatory breath in a ventilation mode.
3. What are the advantages of Pressure Control Ventilation?
4. Explain the causes of auto-PEEP.
5. How will you trouble shoot when a high pressure alarm goes off during mechanical ventilation?
6. What are the indices which predict success of weaning after mechanical ventilation?
7. Describe T-piece trial.
8. As a therapist what are the things which should be kept ready for endotracheal intubation.
9. Describe methods to reduce occurrence of pulmonary embolism in a critically ill patient.
10. Describe few methods you can adopt as a therapist to reduce the incidence of nosocomial infections.

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Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on: **(3 x 10 = 30)**

1. Define weaning. Explain protocol on weaning and its criteria in detail.
2. Define PEEP. Explain its effect on hemodynamics and pulmonary system in detail.
3. Define NIV – its indication and complications. Discuss on initiation and monitoring of NIV.

II. Write Notes on: **(8 x 5 = 40)**

1. Differentiate asthma and COPD. Explain in detail on ventilator management in a exacerbation of COPD.
2. Neuromuscular blocking agents.
3. Pressure regulated volume control (PRVC).
4. Define Auto PEEP. Illustrate Auto PEEP in a flow volume loop. How will you optimize Auto PEEP in a patient on mechanical ventilation?
5. Alarm settings.
6. Write a note on care of artificial airways in mechanical ventilation.
7. Nutrition in COPD.
8. Postural drainage.

III. Short Answers on: **(10 x 3 = 30)**

1. Airway resistance.
2. Tension pneumothorax.
3. How do you troubleshoot high peak airway pressure in a patient on mechanical ventilation?
4. ECMO criteria.
5. Diffusion defect.
6. Ventilator strategy in traumatic brain injury.
7. EtCo₂ – draw a normal capnogram and label its phases.
8. Alveolar – arterial tension gradient (P(A-a)O₂).
9. Heliox therapy.
10. Inverse ratio ventilation.

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Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x 10 = 30)

1. Write a brief note on indication, complication, supportive care of mechanical ventilation.
2. Define ARDS. Write a note on ventilation strategies in an ARDS patient. Explain the physiological effects of prone ventilation.
3. Define recruitment maneuver, various types and complication of recruitment maneuver.

II. Write Notes on:

(8 x 5 = 40)

1. Resistance and compliance.
2. Extra pulmonary effects of positive pressure ventilation.
3. ECMO.
4. Weaning indices.
5. Techniques to improve aerosol drug delivery in mechanical ventilation.
6. Write a short note on transportation of critically ill patients.
7. Alarm settings.
8. Write a note on interpretation of ABG.

III. Short Answers on:

(10 x 3 = 30)

1. Trigger.
2. Rapid shallow breathing index (RSBI).
3. Respiratory alkalosis.
4. Deadspace ventilation.
5. Inhaled nitric oxide.
6. Barotraumas.
7. Cardiac output.
8. Illustrate leak in a flow-volume loop and volume – time scalar.
9. Suction and its complications.
10. Ventilator associated pneumonia.

[LP 0819]

AUGUST 2019

Sub. Code: 2616

B.Sc. RESPIRATORY THERAPY

THIRD YEAR

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Q.P. Code: 802616

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x 10 = 30)

1. Hypoxaemic respiratory failure.
2. Monitoring of a mechanically ventilated patients.
3. Define acute exacerbation of COPD. Write on its ventilatory and medical management.

II. Write Notes on:

(8 x 5 = 40)

1. Define capnography and its significance.
2. Prone ventilation.
3. Indication and complication of mechanical ventilation.
4. Define deadspace and its types.
5. Extubation – criteria, protocol and complication.
6. Types of respiratory failure.
7. Ventilator graphics – explain on loops.
8. Define VAP. Explain on VAP prevention bundle.

III. Short Answers on:

(10 x 3 = 30)

1. Neostigmine.
2. Respiratory quotient.
3. Pulse oximetry.
4. Auto PEEP.
5. Peak inspiratory pressure.
6. Metabolic acidosis.
7. CPIS (Clinical Pulmonary Infection Score).
8. Minimal occlusion volume technique.
9. Ventilator induced lung injuries.
10. Permissive hypercapnia.

B.Sc. RESPIRATORY THERAPY

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Q.P. Code: 802616

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x 10 = 30)

1. Chronic Respiratory Failure.
2. Types of Ventilators and their mode of function, advantage and disadvantages.
3. A patient on Mechanical ventilation develops respiratory distress and Oxygen desaturation. Enumerate steps of trouble shooting this problem.

II. Write Notes on:

(8 x 5 = 40)

1. Respiratory muscle weakness.
2. Noninvasive Ventilation in Chronic conditions.
3. Invasive ventilatory management of patient with COPD.
4. Negative pressure Ventilation.
5. Weaning from Mechanical Ventilator.
6. Difference between Continuous (CMV) and Intermittent (IMV) mandatory Ventilation.
7. Targeting schemes of Mechanical Ventilator.
8. Alarm settings in Ventilators.

III. Short Answers on:

(10 x 3 = 30)

1. Diffusion Impairment.
2. How Mechanical Ventilation decreases shunt?
3. Effects of Mechanical Ventilation on Dead Space.
4. Alveolar Hypoventilation.
5. Impairment of Respiratory Control.
6. Airway resistance.
7. Tension Pneumothorax.
8. ECMO – indications, contraindications, application and adverse events.
9. Plan for Mechanical ventilation in a patient with head injury.
10. Patient positioning to optimize ventilation and Oxygenation during Mechanical Ventilation.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LR 1220]

**DECEMBER 2020
(AUGUST 2020 EXAM SESSION)**

Sub. Code: 2616

**BACHELOR IN RESPIRATORY THERAPY
THIRD YEAR
PAPER I – RESPIRATORY THERAPY TECHNIQUES - I
Q.P. Code: 802616**

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Hypercapnic Respiratory Failure.
2. Complications of Mechanical Ventilation.
3. Effects of Mechanical ventilation on Ventilation and Oxygenation.

II. Write Notes on:

(8 x 5 = 40)

1. Noninvasive Ventilation in Acute conditions.
2. Decreased inspired Oxygen.
3. Venous Admixture.
4. Control Variable in Pressure controlled ventilation.
5. Trigger and Cycle variables in Mechanical Ventilation.
6. Concept of time constant in Mechanical ventilation.
7. Auto PEEP, How to optimize Auto PEEP in a patient on ventilator?
8. Cardiovascular effects of Positive pressure Mechanical Ventilation.

III. Short Answers on:

(10 x 3 = 30)

1. High Peak airway pressure in patient on Mechanical Ventilator. Causes and algorithm of troubleshooting.
2. Indicators of Ventilatory support in Hypoxemic Respiratory failure.
3. Advantages / Disadvantages / indications of Volume Control ventilation.
4. Perfusion Diffusion impairment.
5. Decreased Ventilatory Drive.
6. Type 1 Respiratory Failure.
7. Prevention of Nosocomial Pneumonia in Mechanically Ventilated patient.
8. Contraindications of Non-Invasive Ventilation.
9. Predictors of Successful weaning after Mechanical Ventilation.
10. Prevention of Thromboembolism in patients on ICU care.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0122]

JANUARY 2022

Sub. Code: 2616

(FEBRUARY 2021 & AUGUST 2021 EXAM SESSION)

B.Sc. RESPIRATORY THERAPY

THIRD YEAR (Regulation from 2014-2015)

PAPER I – RESPIRATORY THERAPY TECHNIQUES - I

Q.P. Code: 802616

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Define type 2 respiratory failure? What are the causes of type 2 respiratory failure? Outline the management of type 2 respiratory failure.
2. Define peak pressure and plateau pressure? What are the causes of high peak pressure and plateau pressure?
3. Rapid sequence intubation (RSI).

II. Write Notes on:

(8 x 5 = 40)

1. Various interfaces used with non invasive ventilator (NIV).
2. Airway pressure release ventilation (APRV).
3. Oxygen toxicity.
4. Types of ECMO and Indications of ECMO.
5. End tidal CO₂ monitoring in mechanically ventilated patient.
6. Laryngeal mask airway.
7. VAP bundle.
8. Complications of mechanical ventilation.

III. Short Answers on:

(10 x 3 = 30)

1. Management of tension pneumothorax.
2. Permissive hypercapnea.
3. A-a gradient.
4. Predictors of weaning failure.
5. Midazolam.
6. Physiological dead space.
7. Name six causes for hypoxemic respiratory failure.
8. Oxygen dissociation curve.
9. PaO₂/FiO₂(P/F) ratio.
10. Rapid shallow breathing index.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0922]

SEPTEMBER 2022

Sub. Code: 2616

(FEBRUARY 2022 & AUGUST 2022 EXAM SESSIONS)

B.Sc. RESPIRATORY THERAPY

THIRD YEAR (Regulation from 2014-2015)

PAPER I – RESPIRATORY THERAPY TECHNIQUES - I

Q.P. Code: 802616

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Define weaning from ventilator and explain weaning protocol.
2. Ventilatory management of Acute Respiratory Distress Syndrome (ARDS).
3. Define Ventilator Associated Pneumonia (VAP). Diagnostic criteria for VAP. Preventive measures for VAP.

II. Write Notes on:

(8 x 5 = 40)

1. Define peak pressure and plateau pressure.
2. Lung recruitment maneuvers.
3. Role of neuromuscular blocking agents in a ventilated patient.
4. Complications of mechanical ventilation.
5. Definite airway.
6. Define auto PEEP. What are the causes of auto PEEP?
7. Ventilator strategies to improve carbon dioxide removal.
8. Monitoring in a mechanically ventilated patient.

III. Short Answers on:

(10 x 3 = 30)

1. Cuff leak test.
2. Inspiratory positive airway pressure.
3. Negative pressure ventilation.
4. End tidal CO₂ monitoring.
5. Draw and label endotracheal tube.
6. Causes of Type 2 respiratory failure.
7. Closed suction and its advantages.
8. Clinical indications of continuous positive airway pressure.
9. Define- Trigger and Cycling.
10. Anatomical dead space.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0423]

APRIL 2023

Sub. Code: 2616

**B.Sc. RESPIRATORY THERAPY
THIRD YEAR (Regulations 2014-2015 & 2018-2019 onwards)
PAPER I – RESPIRATORY THERAPY TECHNIQUES - I
Q.P. Code: 802616**

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Define ARDS. What is Berlin's criteria? Describe different Recruitment maneuvers for ARDS management.
2. What are the different modes of ventilation? Describe and elaborate on them. Mention the different advantages of SIMV and ASV modes of ventilation.
3. What are the indications and contraindications of NIV? Draw and describe the parts of a standard Bilevel positive airway pressure machine. What are the different masks that can be used for NIV?

II. Write Notes on:

(8 x 5 = 40)

1. What is PEEP? Describe Barotrauma.
2. Types of Respiratory Failure.
3. Differences between CPAP and BPAP.
4. Weaning from mechanical ventilator.
5. What is plateau pressure? What is its significance in mechanical ventilation?
6. What are the indications of Tracheostomy?
7. Describe the risk factors for Nosocomial Pneumonia.
8. Midazolam – Describe some adverse effects.

III. Short Answers on:

(10 x 3 = 30)

1. Emergency treatment of Tension pneumothorax.
2. Chronic respiratory failure.
3. Respiratory muscle weakness.
4. Decreased ventilatory drive.
5. Prevention of Thromboembolism in patients on ICU care.
6. Invasive ventilatory management of patient with COPD.
7. Inspiratory time.
8. Complications of airway suctioning.
9. Deadspace ventilation.
10. RSBI – Rapid Shallow Breathing Index.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1123]

NOVEMBER 2023

Sub. Code: 2616

**B.Sc. RESPIRATORY THERAPY
THIRD YEAR (Regulations 2014-2015 & 2018-2019 onwards)
PAPER I – RESPIRATORY THERAPY TECHNIQUES - I
Q.P. Code: 802616**

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Hypoxemic Respiratory Failure.
2. Types of Alarms in Mechanical Ventilators and their Troubleshooting.
3. Non-invasive Ventilation and its benefits and adverse events.

II. Write Notes on:

(8 x 5 = 40)

1. Increased Carbon dioxide production.
2. Increased work of Breathing.
3. Tension time index.
4. Ventilator output displays.
5. Control variables in Volume Controlled Ventilation.
6. Ventilatory management of Patient with Asthma.
7. Adaptive Servo Ventilation.
8. Nutrition in patient on Mechanical Ventilator.

III. Short Answers on:

(10 x 3 = 30)

1. Acute and Chronic Respiratory Failure.
2. Indications of Ventilatory support in Hypercapnic Respiratory Failure.
3. What is Mandatory Breath in Ventilation mode?
4. Advantages / Disadvantages / Indications of Pressure Control Ventilation.
5. Decreased Ventilatory Drive.
6. Adjustment of Trigger sensitivity in Mechanical Ventilation.
7. Predictors of successful Noninvasive Ventilation in Acute Respiratory Failure.
8. Cardiovascular effects of Positive Pressure Mechanical Ventilation.
9. Chest Physiotherapy in a patient on Mechanical Ventilator.
10. Adverse effects of Inappropriate PEEP in Mechanical Ventilation.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0424]

APRIL 2024

Sub. Code: 2616

B.Sc. RESPIRATORY THERAPY

THIRD YEAR (Regulations 2014-2015 & 2018-2019 onwards)

PAPER I – RESPIRATORY THERAPY TECHNIQUES - I

Q.P. Code: 802616

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Alarms in a Mechanically Ventilated Patient. How will you manage the various Alarms?
2. What are the causes of Type 1 Respiratory Failure? Describe the Ventilator Management of Patient with ARDS.
3. What are the indications and contraindications for Non Invasive Ventilation (NIV)? Describe the steps in initiating in NIV.

II. Write Notes on:

(8 x 5 = 40)

1. Lung recruitment maneuvers.
2. Post extubation care.
3. Clinical Pulmonary Infection Score (CPIS).
4. Induction agents used in Rapid sequence Intubation.
5. Weaning from ventilator.
6. Complications associated with Mechanical Ventilation.
7. What are the types of Respiratory failure?
8. Metabolic acidosis- Types and causes.

III. Short Answers on:

(10 x 3 = 30)

1. Shunt.
2. Various humidifier systems.
3. Auto PEEP.
4. Nutrition in a mechanically ventilated patient.
5. Draw and label an EtCO₂ graph.
6. VAP preventive measures.
7. Inspiratory time and its significance.
8. Succinyl Choline.
9. Oro-pharyngeal airway.
10. Resistance and compliance.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0125]

JANUARY 2025

Sub. Code: 2616

**B.Sc. RESPIRATORY THERAPY
THIRD YEAR (Regulations 2014-2015 & 2018-2019 onwards)
PAPER I – RESPIRATORY THERAPY TECHNIQUES - I
Q.P. Code: 802616**

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Define Auto-PEEP. What are the causes of Auto PEEP? How will you diagnose Auto-PEEP? Outline the steps in the management.
2. Ventilatory management of Acute Respiratory Distress Syndrome (ARDS).
3. Classify Ventilators. Write in detail about Synchronized Intermittent Mandatory Ventilation (SIMV) mode.

II. Write Notes on:

(8 x 5 = 40)

1. Non invasive Mechanical ventilation.
2. Care of patients with mechanical ventilation.
3. Post Extubation Care.
4. High flow nasal oxygen therapy.
5. Weaning from mechanical ventilation.
6. Effects of Positive End Expiratory Pressure (PEEP) in various organs.
7. Adaptive Servo Ventilation (ASV).
8. Causes of high pressure and low pressure alarms in ventilator.

III. Short Answers on:

(10 x 3 = 30)

1. Rapid shallow breathing index.
2. Management of post expiratory stridor.
3. Draw and label normal capnography waveform.
4. Principle of pulse oximeter.
5. Venturi device.
6. Complications of Mechanical ventilation.
7. Personal protective measures while managing a patient with SARS CoV-2.
8. Dead space.
9. Permissive hypercapnea.
10. T-piece trial.

B.Sc. RESPIRATORY THERAPY
THIRD YEAR (Regulations 2014-2015 & 2018-2019 onwards)
PAPER I – RESPIRATORY THERAPY TECHNIQUES - I
Q.P. Code: 802616

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. What are all the types of Ventilation? Write in detail about High frequency Oscillating ventilation.
2. What is peak pressure and plateau pressure? Describe the various causes of high peak pressure and plateau pressure.
3. Define Recruitment maneuvers. Write about various types and complications of Recruitment maneuvers.

II. Write Notes on:

(8 x 5 = 40)

1. What are all the contraindications of Non-Invasive Ventilation (NIV) in COPD.
2. Describe Adaptive Servo Ventilation.
3. Difference between Continuous Mandatory Ventilation (CMV) and Intermittent Mandatory Ventilation (IMV).
4. What is Positive End-Expiratory Pressure (PEEP)? Describe about Barotrauma.
5. Ventilator Graphics – Explain about Loops.
6. Techniques to improve Aerosol drug delivery in mechanical ventilation.
7. Modes of NIV (Non invasive ventilation).
8. Ventilator strategies to improve carbon Dioxide removal.

III. Short Answers on:

(10 x 3 = 30)

1. Prone ventilation.
2. VAP (Ventilator-Associated Pneumonia) Bundle.
3. Complications of Mechanical ventilation.
4. Weaning protocol.
5. Extubation care.
6. Define Dead space and its types.
7. Respiratory Alkalosis.
8. Ventilator setting in Traumatic Brain Injury.
9. Heliox therapy.
10. Respiratory acidosis.

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[AHS 1125]

NOVEMBER 2025

Sub. Code: 2616

**B.Sc. RESPIRATORY THERAPY
THIRD YEAR (Regulations 2014-2015 & 2018-2019 onwards)
PAPER I – RESPIRATORY THERAPY TECHNIQUES - I
Q.P. Code: 802616**

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on: (3 x 10 = 30)

1. Complications of Mechanical ventilation.
2. Humidification in Respiratory therapy – Types and importance.
3. Define ARDS. Write a note on Ventilation strategies in an ARDS patient.

II. Write Notes on: (8 x 5 = 40)

1. Describe Adaptive servo ventilation.
2. What are the advantages and disadvantages of pressure control ventilation?
3. Role of Respiratory therapist in critical care unit.
4. Prone ventilation.
5. Post Extubation management.
6. ECMO.
7. Aerosol therapy.
8. Describe the control variables of a ventilator.

III. Short Answers on: (10 x 3 = 30)

1. Permissive hypercapnia.
2. Airway Resistance.
3. Peak Inspiratory pressure.
4. Decreased ventilatory drive.
5. Effects of Mechanical ventilation on dead space.
6. Volume control ventilation – Advantages and disadvantages.
7. Alveolar hypoventilation.
8. Type 1 Respiratory failure.
9. Trouble shooting.
10. Predictors of successful weaning after Mechanical ventilation.
