

B.Sc. CRITICAL CARE TECHNOLOGY
(New Syllabus 2014-2015)

SECOND YEAR

**PAPER III – ICU MONITORING I (BASIC) AND
BIOMEDICAL ENGINEERING**

Q.P. Code: 801218

Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. Describe the monitoring techniques used to assess the Neurological status, Renal and Liver functions of a patient in ICU.
2. What are the methods and significance of measuring the following Lung volume and flow in ICU :
 - a) Tidal volume
 - b) Vital capacity.
 - c) Increased Peak pressure
 - d) Positive End Expiration Pressure (PEEP).
3. How do you evaluate and Monitor a patient with sudden Loss of conscious in ICU?

II. Write notes on:

(8 x 5 = 40)

1. Evaluation of Acute chest pain.
2. Arterial Blood gas parameters.
3. Complications during Haemodialysis.
4. Multiparameter Monitor.
5. Clinical findings in Tension Pneumothorax.
6. Management of `Hypokalemia.
7. Management of Hypoxia on Ventilated patient.
8. What is Resistance and Capacitance?

III. Short answers on:

(10 x 3 = 30)

1. Tracheostomy Care.
2. Prevention of Bed sore.
3. What is the difference between AC and DC Current?
4. Ryles tube.
5. What is Ethylene oxide sterilization?
6. Kirchhoff's Law – Electrical Circuit.
7. ECG changes in Hyperkalemia.
8. Endoscopy.
9. Three symptoms of Hypoglycemia.
10. Classify Medical Instruments.

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Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. Describe the Four Arrest Rhythms and the cause of sudden cardiac arrest in ICU.
2. Describe the following in detail:
 - a. Arterial Blood Gas
 - b. Pulse oximetry
 - c. Bag Mask Ventilation – Label and techniques.
3. Describe the various types and uses of Medical equipments in ICU.

II. Write notes on:

(8 x 5 = 40)

1. Glasgow Coma Scale.
2. Prophylaxis in deep vein thrombosis.
3. Management of Pneumothorax.
4. Tracheal Intubation.
5. Post Resuscitation Care.
6. Management of Scorpion sting.
7. Pulmonary embolism.
8. Intercostal drainage.

III. Short answers on:

(10 x 3 = 30)

1. Three causes of Upper Respiratory Bleeding.
2. Three causes of Respiratory Acidosis.
3. What is Pleural effusion?
4. Oropharyngeal Airway.
5. Defibrillator.
6. What are Invasive and Non invasive Ventilators?
7. What is Lung Contusion?
8. Precautions before Extubating a Patient.
9. Acquired Cross infections in ICU.
10. Tracheostomy care.

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Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. Describe the following:
 - a) Invasive Arterial Blood Pressure
 - b) CVP Monitoring.
 - c) Zeroing, Calibrating, Trouble shooting of Pressure Transducer
2. List the indications for Intubation. How to assess difficult Airway?
Describe the procedure for Rapid Sequence Intubation.
3. What are the Parameters to monitor daily in a severe Head injury patient going into Multi organ dysfunction?

II. Write notes on:

(8 x 5 = 40)

1. Brain death and organ donation.
2. What is Phase, Neutral and Earth in Electrification?
3. Management of Hyperkalemia.
4. Inductance and Transformers.
5. Evaluation of Tachycardia.
6. 12 Leads ECG – positions.
7. Parameters of Electricity – voltage, current, power.
8. Monitoring Hypoglycemia in ICU.

III. Short answers on:

(10 x 3 = 30)

1. Ohm's Law.
2. Three causes for Bradycardia.
3. Indications for CPAP ventilation.
4. Capillary Refilling Time.
5. Parts of Laryngoscope.
6. Apnoea Alarm.
7. Complications of Arterial Line.
8. List out the things to check before using Defibrillator.
9. Capnography.
10. Airway protection in unconscious patient.

[LM 0218]

FEBRUARY 2018

Sub. Code: 1218

B.Sc. CRITICAL CARE TECHNOLOGY

(New Syllabus 2014-2015 & 2015-2016)

SECOND YEAR

**PAPER III – ICU MONITORING I (BASIC) AND
BIOMEDICAL ENGINEERING**

Q.P. Code: 801218

Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. Advantages and disadvantages of Prone Positioning for respiratory failure.
2. Advantages and disadvantages of various modes of temperature monitoring in the ICU.
3. Pulse oximetry - Principals, advantages and pitfalls in monitoring.

II. Write notes on:

(8 x 5 = 40)

1. End Tidal Co₂ monitoring.
2. Alveolar Gas equation.
3. Dead Space.
4. Shunt.
5. V/Q mismatch.
6. Monitoring renal function in ICU.
7. Monitoring of sedation in ICU.
8. Zeroing the transducer.

III. Short answers on:

(10 x 3 = 30)

1. What is normal Minute Ventilation?
2. Draw ECG Change with Myocardial Ischaemia.
3. Draw End Tidal CO₂ trace in Obstructive Airway disease.
4. Draw End tidal Co₂ change with in cardiac arrest or low cardiac output.
5. List 5 Methods to confirm endotracheal intubation.
6. Draw CVP trace and label.
7. List 3 causes of damping.
8. List methods of ICP monitoring.
9. List pitfalls of NIBP monitoring.
10. What is normal Oxygen consumption (in ml/minute)? List factors affecting Oxygen consumption.

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SECOND YEAR

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Q.P. Code: 801218

Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. What is Hyperthermia? What are some causes? What are the physiological effects of hyperthermia?
2. End Tidal CO₂ monitoring- Principles, advantages and pitfalls in monitoring.
3. Non Invasive Blood Pressure monitoring: Principles, advantages and pitfalls in monitoring.

II. Write notes on:

(8 x 5 = 40)

1. Need of checking cuff pressure in ICU.
2. PaO₂/ FiO₂ ratio.
3. Factors that affect oxygen consumption.
4. Work of breathing.
5. Importance of monitoring lung volume in ICU patients.
6. CVP wave form.
7. Importance of Monitoring of level of sedation in ICU.
8. Factors affecting urine output in ICU patients.

III. Short answers on:

(10 x 3 = 30)

1. Classify intra-abdominal hypertension.
2. List factors that cause increased airway resistance in ventilated patients.
3. List factors that increase ICP.
4. List 3 factors that cause damping of arterial trace and their management steps.
5. List methods of measuring cardiac output in ICU.
6. Draw ETCO₂ trace of a situation with air leak in the circuit.
7. List 3 hypoxemia.
8. List 3 causes of hypercapnoea.
9. List 3 causes of shock in ICU.
10. Mention 3 causes of drowsiness in ICU patients.

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Q.P. Code: 801218

Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. A patient is admitted to ICU and is intubated for hypoxemia due to left side lower lobe pneumonia. What is the position of choice for ventilation and why? List the side effects of prone position.
2. What are indications for active cooling of a patient in ICU? List some side effects of hypothermia.
3. What are risk factors for Pressure Sores? How can pressure sores be classified?

II. Write notes on:

(8 x 5 = 40)

1. Sites of measurement of temperature in ICU patients.
2. Need for maintenance of cuff pressure.
3. Oxygen dissociation curve.
4. Criteria for extubation.
5. Methods to confirm endotracheal intubation.
6. Monitoring CVP: advantages and disadvantages.
7. Neuro-protective strategies.
8. What are the advantages of ECG monitoring in ICU?

III. Short answers on:

(10 x 3 = 30)

1. What are uses of capnography in ICU patients?
2. List parameters you will monitor in head injury patient.
3. List methods of assessing renal function in ICU.
4. Draw Pressure vs time scale for Volume control ventilation and label Peak and plateau pressures.
5. List directly measured variables in an ABG.
6. List common reasons for self-extubation.
7. List three causes of high blood pressure in the ICU.
8. List three causes of low blood pressure in the ICU.
9. List disadvantages of NIBP monitoring.
10. List three causes of hypercapnoea (increased level of pCO₂) in a blood gas.

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Q.P. Code: 801218

Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. Pulse oximetry - Principals, advantages and pitfalls in monitoring.
2. What are the methods and significance of measuring the following Lung volume and flow in ICU :
 - a) Tidal volume
 - b) Vital capacity.
 - c) Increased Peak pressure
 - d) Positive End Expiration Pressure (PEEP)
3. List the indications for Intubation. How to assess difficult Airway? Describe the procedure for Rapid Sequence Intubation.

II. Write notes on:

(8 x 5 = 40)

1. Evaluation of Acute chest pain.
2. Arterial Blood gas parameters.
3. Complications during Haemodialysis.
4. Multiparameter Monitor.
5. Prophylaxis in deep vein thrombosis.
6. Management of Pneumothorax.
7. What is Resistance and Capacitance?
8. Post Resuscitation Care.

III. Short answers on:

(10 x 3 = 30)

1. What is normal Minute Ventilation?
2. Draw ECG Change with Myocardial Ischaemia.
3. Draw End Tidal CO₂ trace in Obstructive Airway disease.
4. Draw End tidal CO₂ change with cardiac arrest or low cardiac output.
5. Acquired Cross infections in ICU.
6. Draw CVP trace and label.
7. List 3 causes of damping.
8. List methods of ICP monitoring.
9. List pitfalls of NIBP monitoring.
10. What is normal Oxygen consumption (in ml/minute)? List factors affecting Oxygen consumption.

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SECOND YEAR

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Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. Describe the following in detail:
 - a) Arterial blood gas
 - b) Pulse oximetry
 - c) Bag mask ventilation – label and techniques
2. Non invasive blood pressure monitoring - principles, advantages and pitfalls in monitoring.
3. How do you evaluate and monitor a patient with sudden loss of conscious in ICU?

II. Write notes on:

(8 x 5 = 40)

1. Management of hyperkalemia.
2. Inductance and transformers.
3. Alveolar gas equation.
4. Dead space.
5. Shunt.
6. V/Q mismatch.
7. PaO₂/ FiO₂ ratio.
8. Factors that affect oxygen consumption.

III. Short answers on:

(10 x 3 = 30)

1. Endoscopy.
2. Three symptoms of hypoglycemia.
3. Classify medical instruments.
4. Three causes of upper respiratory bleeding.
5. Three causes of respiratory acidosis.
6. What is pleural effusion?
7. Draw ETCO₂ trace of a situation with air leak in the circuit.
8. List 3 hypoxemia.
9. Apnoea alarm.
10. Complications of arterial line.

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

[AHS 0321]

MARCH 2021

Sub. Code: 1218

(AUGUST 2020 EXAM SESSION)

B.Sc. CRITICAL CARE TECHNOLOGY

SECOND YEAR (From 2014-2015 and 2015-2016 onwards)

PAPER III – ICU MONITORING I (BASIC) AND BIOMEDICAL ENGINEERING

Q.P. Code : 801218

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Describe the following:
 - a) Invasive Arterial Blood Pressure.
 - b) CVP Monitoring.
 - c) Zeroing, Calibrating, Trouble shooting of Pressure Transducer.
2. Advantages and disadvantages of various modes of temperature monitoring in the ICU.
3. Pulse oximetry - Principals, advantages and pitfalls in monitoring.

II. Write notes on:

(8 x 5 = 40)

1. Clinical findings in Tension Pneumothorax.
2. Management of Hypoxia in Ventilated patients.
3. What is Resistance and Capacitance?
4. Glasgow Coma Scale.
5. Prophylaxis in deep vein thrombosis.
6. Management of Pneumothorax.
7. Tracheal Intubation.
8. Post Resuscitation Care.

III. Short answers on:

(10 x 3 = 30)

1. Tracheostomy Care (1 Time Repeated).
2. Prevention of Bed sore.
3. What is the difference between AC and DC Current?
4. Ryles tube.
5. Precautions before Extubating a Patient.
6. Acquired Cross infections in ICU.
7. Ohm's Law.
8. Three causes for Bradycardia.
9. Indication for CPAP ventilation.
10. Capillary Refilling Time.

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

[AHS 0222]

**FEBRUARY 2022
(AUGUST 2021 EXAM SESSION)**

Sub. Code: 1218

**B.Sc. CRITICAL CARE TECHNOLOGY
SECOND YEAR (From 2014-2015 and 2015-2016 onwards)
PAPER III – ICU MONITORING I (BASIC) AND BIOMEDICAL ENGINEERING
Q.P. Code : 801218**

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Define shock. Discuss the classification of shock. Write in detail about septic shock and its management.
2. Draw a normal CVP trace and label the parts? What are the precautions you will take to prevent infection in a patient with central Line? How will you troubleshoot a damped CVP trace in a patient?
3. Discuss about the management of snake bite patient with ventilator setting. Describe the steps in troubleshooting.

II. Write notes on:

(8 x 5 = 40)

1. Five reasons for Hypoxia on a ventilated patient.
2. Oxygen delivery system.
3. Monitoring of cuff pressure in ICU.
4. Difference between AC and DC power supply.
5. Non rebreather bag.
6. How will you clean and maintain ICU equipment?
7. Describe the sequence of endotracheal intubation.
8. Post resuscitation care.

III. Short answers on:

(10 x 3 = 30)

1. Bed sore.
2. Apnoea alarm.
3. Define Bradycardia.
4. Positive pressure ventilation.
5. X-Ray finding in Pleural Effusion.
6. Capnography.
7. Mention four causes of increased ICP.
8. Creatinine clearance test.
9. Define cardiac index.
10. APACHE Score.
