

# MANIPAL UNIVERSITY

**FIRST YEAR M.Sc. R.T. DEGREE EXAMINATION – MAY/JUNE 2012**

**SUBJECT: ADVANCED BIOSTATISTICS & RESEARCH METHODOLOGY**

Tuesday, May 29, 2012

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

✍ **Answer ALL the questions.**

- 1A. Define mean, median, mode, standard deviation and coefficient of variation for 'n' observations.
- 1B. Explain stratified random sampling method. (5+5 = 10 marks)
2. Fifty patients with congestive heart failure were weighed before and after receiving a novel diuretic agent and the average weight loss (the difference between the two weights) for this sample was found to be 3.5 KG with a standard error of 2.6 Kg.
- 2A. Name the statistical test used for testing whether the agent is effective in reducing the weight.
- 2B. State the null and alternate hypothesis.
- 2C. Write the test statistic for this test.
- 2D. Mention the assumptions for the validity of this test.
- 2E. How do you take a decision on the acceptance or rejection of null hypothesis? (2×5 = 10 marks)
- 3A. What do you mean by sampling distribution and standard error? What are the factors that affect the width of a confidence interval for mean?
- 3B. Write a short note on binomial distribution. ((2+3)+5 = 10 marks)
4. What do you mean by randomization in randomised controlled trials (RCTs)? Explain different methods of randomization in RCTs. (1+9 = 10 marks)
- 5A. A hospital administrator wishes to estimate the mean weight of babies born in the hospital. How large a sample of birth records should be taken if the administrator wants a 95% confidence interval with margin error of 1.2 Kg? Assume that a reasonable estimate of the population standard deviation is 5 Kg.
- 5B. Write a short note on cross sectional study design. (5+5 = 10 marks)
6. Explain the structure of a research thesis. (10 marks)
7. **Write short notes on:**
- 7A. Chi square test
- 7B. Survival analysis
- 7C. Validity of a diagnostic test
- 7D. One way ANOVA (5×4 = 20 marks)



**MANIPAL UNIVERSITY****FIRST YEAR M.Sc. (RESPIRATORY THERAPY) DEGREE EXAMINATION – MAY/JUNE 2012****SUBJECT: BASIC SCIENCES  
(SPECIALTY: ADULT CARDIO RESPIRATORY CARE)**

Thursday, May 31, 2012

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

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1. Describe briefly the reflex control and chemical control of breathing. What is the effect of carbon dioxide on cerebral blood flow?  
(12+4 = 16 marks)
2. Describe briefly the causes, mechanism and primary indicators of hypoxia.  
(5+6+5 = 16 marks)
3. **Short Notes:**
- 3A. Hyponatremia
- 3B. Dead space ventilation
- 3C. Oxygen dissociation curve
- 3D. Adrenergic bronchodilators
- 3E. Non bicarbonate buffer systems
- 3F. Blood supply of heart  
(8×6 = 48 marks)



**MANIPAL UNIVERSITY****FIRST YEAR M.Sc. (RESPIRATORY THERAPY) DEGREE EXAMINATION – MAY/JUNE 2012****SUBJECT: ADVANCED RESPIRATORY THERAPY SCIENCE I****(Common for both Neonatal & Paediatric Respiratory Care and Adult Cardio Respiratory Care)**

Saturday, June 02, 2012

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

**✍ Draw diagram where necessary.**

1. You are asked to evaluate a 65 year old man with an old case of COPD, readmitted for exacerbation and distress. His ABG shows pH-7.25, PaCO<sub>2</sub>-72 mmHg, PaO<sub>2</sub>-45 mmHg, HCO<sub>3</sub><sup>-</sup>-28 mmol, BE - +4 mmol.

What mode of ventilation would you choose for this patient and why? Discuss invasive ventilation versus non-invasive ventilation.

(8+8 = 16 marks)

2. Complications of positive pressure ventilation on intracranial pressure, renal function and gastrointestinal function.

(6+6+4 = 16 marks)

3. **Write short notes on:**

- 3A. Work of breathing  
3B. Humidification therapy  
3C. Automated tube compensation  
3D. Pressure gradient of spontaneous breathing  
3E. Inspiratory hold  
3F. Ventilatory associated pneumonia

(8×6 = 48 marks)



**MANIPAL UNIVERSITY****FIRST YEAR M.Sc. (RESPIRATORY THERAPY) DEGREE EXAMINATION – MAY/JUNE 2012****SUBJECT: CRITICAL CARE MEDICINE – I  
(SPECIALTY: ADULT CARDIO RESPIRATORY CARE)**

Tuesday, June 05, 2012

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

1. Describe the categories of hyponatremia with causes for each category. Briefly describe the treatment of hyperkalemia.  

(5+5+6 = 16 marks)
  
2. Describe the causes, pathophysiology and the current treatment of Acute Respiratory Distress syndrome.  

(4+5+7 = 16 marks)
  
3. **Write short notes on:**
  - 3A. Methods to prevent Ventilator associated pneumonia
  - 3B. Asbestosis
  - 3C. Amniotic fluid embolism
  - 3D. Routes of nutritional support for ICU patients
  - 3E. Organophosphorous poisoning
  - 3F. Metabolic alkalosis

(8×6 = 48 marks)

