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MANIPAL UNIVERSITY

THIRD YEAR B.Sc. R.R.T. & D.T./B.Sc. C.V.T./B.Sc. M.R.T/B.Sc. R.T./B.Sc. M.L.T./
FOURTH YEAR B.O.T./B.P.T. DEGREE EXAMINATION – JUNE 2016

**SUBJECT: BIOSTATISTICS & RESEARCH METHODOLOGY/RESEARCH
METHODOLOGY & STATISTICS/BIOSTATISTICS/ BASIC BIOSTATISTICS &
RESEARCH METHODOLOGY/RESEARCH METHODOLOGY AND BIOSTATISTICS**

Wednesday, June 01, 2016

Time: 10:00-13:00 Hrs.

Max. Marks: 80

✍ **Answer ALL the questions.**

1. Differentiate between nominal and ordinal variables with examples. (4 marks)

2. **Classify the following into the four different scales of measurement:**

2A. Cell counts

2B. Blood group

2C. Pain score

2D. IQ

(4 marks)

3. **State true or false:**

3A. Pearson's correlation coefficient always takes values ≥ 0

3B. Incidence is not affected by the duration of disease

3C. Convenience sampling is a procedure that assures that each element in the population have equal chance of being included in the sample

3D. Health information system is sample based

(4 marks)

4. At rest pulse rates for 22 athletes at a meet are

68 60 78 70 63 68 66 57 74 65 57

66 73 67 68 56 74 64 67 77 72 64

4A. Compute mean, median and range of this data

4B. Construct a frequency distribution table along with relative frequencies for this data using class intervals 55 – 60, 60 – 65, 65 – 70 and so on.

4C. Draw a frequency polygon for the frequency table constructed above.

(6+5+4 = 15 marks)

5. Obtain interquartile range for the data regarding number of dental caries in twelve children less than ten years of age.

6 0 2 1 0 4 6 0 4 2 8 3

(8 marks)

6. Define coefficient of variation. Mean and standard deviation of pulse rate for a group of individuals is 76 and 3 beats per minute respectively. The mean and standard deviation of height is 64 and 2 inches respectively. Which of the two characteristics is more consistent?

(5 marks)

7. **Define the following:**

- 7A. Case fatality rate
- 7B. Total fertility rate
- 7C. Crude death rate

(2 marks \times 3 = 6 marks)

8. The amount of weight gained during pregnancy was assessed and was found to be approximately normally distributed with a mean weight gain of 10 kgs and a standard deviation of 3kgs. Calculate the proportion of pregnant women who gained weight.

- 8A. At most 16 kgs
- 8B. Between 10 to 13 kgs
- 8C. At least 7 kgs

(3 marks \times 3 = 9 marks)

9. **Write short notes on:**

- 9A. Inter rater reliability
- 9B. Descriptive epidemiology
- 9C. Systematic sampling
- 9D. Sample registration system
- 9E. Components of health information system

(5 marks \times 5 = 25 marks)



MANIPAL UNIVERSITY
THIRD YEAR B. Sc. M.L.T. DEGREE EXAMINATION – JUNE 2016

SUBJECT: CYTOLOGY AND CYTOGENETICS
(NEW REGULATION)

Friday, June 03, 2016

Time: 10:00-13:00 Hrs.

Max. Marks: 80

Answer ALL the questions.

1A. Discuss about specimen collection, processing and cytology of female genital tract.
(4+4+7 = 15 marks)

1B. Elaborate on karyotyping and add a note on classification of chromosomes.
(9+6 = 15 marks)

2. **Write detailed notes on:**

2A. Bierbrich scarlet – Fastgreen staining

2B. Factors influencing Papanicolaou staining

2C. Cell block preparation

2D. Fixatives and fixation methods in cytology

2E. Pathologic urinary crystals

2F. Apoptosis

2G. Sudan black B for smears

(5 marks × 7 = 35 marks)

3. **Write short notes on:**

3A. Mailing of unstained smears

3B. Squamo columnar junction

3C. Down syndrome

3D. Intra operative cytology

3E. Destaining of slides

(3 marks × 5 = 15 marks)



MANIPAL UNIVERSITY**THIRD YEAR B. Sc. M.L.T. DEGREE EXAMINATION – JUNE 2016****SUBJECT: GENERAL BACTERIOLOGY, IMMUNOLOGY AND SYSTEMIC BACTERIOLOGY
(NEW REGULATION)**

Monday, June 06, 2016

Time: 10:00-13:00 Hrs.

Max. Marks: 80

✍ **Answer ALL questions.**

✍ **Draw diagrams if necessary.**

1. Define and describe Bacterial conjugation with a neat labelled diagram. Add a note on F plasmids.

(2+10+3 = 15 marks)

2. Describe the mode of infection, pathogenesis and lab diagnosis of Vibrio cholera.

(2+6+7 = 15 marks)

3. **Write briefly on the followings:**

3A. Types of ELISA test

3B. Pathogenesis of syphilis

3C. Pathogenesis and lab diagnosis of tetanus

3D. Definition and detection of Nosocomial infection

3E. Moist heat sterilization at 100°C

(7 marks × 5 = 35 marks)

4. **Write short notes on:**

4A. Coagulase test

4B. Pathogenesis of Meningococcal infection

4C. IgG

4D. Taxonomic classification of bacteria

4E. Ziehl - Neelsen staining

(3 marks × 5 = 15 marks)



MANIPAL UNIVERSITY**THIRD YEAR B. Sc. M.L.T. DEGREE EXAMINATION – JUNE 2016****SUBJECT: HISTOPATHOLOGICAL TECHNIQUES
(NEW REGULATION)**

Wednesday, June 08, 2016

Time: 10:00-13:00 Hrs.

Max. Marks: 80

- ✍ **Answer ALL the questions.**
- ✍ **Draw diagrams if necessary.**

1A. Define and classify fixatives. Describe formaldehyde containing fixatives, their advantages and disadvantages.

(2+4+9 = 15 marks)

1B. List the staining methods used for the demonstration of collagen fibers. Discuss the reagent preparation and procedure for Van Gieson's staining technique.

(3+5+7 = 15 marks)

2. **Write briefly on:**

- 2A. Methods of decalcification
- 2B. Staining of reticulin fibers
- 2C. Mercuric chloride containing fixatives
- 2D. ZN stain for Acid Fast Bacilli
- 2E. Embedding tissue in paraffin wax
- 2F. Adhesives
- 2G. Honing and stropping

(5 marks × 7 = 35 marks)

3. **Write short notes on:**

- 3A. Mounting Media
- 3B. Rotary Microtome
- 3C. PAS staining
- 3D. Mayer's Haematoxylin
- 3E. Dehydration

(3 marks × 5 = 15 marks)



MANIPAL UNIVERSITY**THIRD YEAR B. Sc. M.L.T. DEGREE EXAMINATION – JUNE 2016****SUBJECT: MYCOLOGY, VIROLOGY AND PARASITOLOGY
(NEW REGULATION)**

Friday, June 10, 2016

Time: 10:00-13:00 Hrs.

Max. Marks: 80

✍ **Answer ALL questions.**

✍ **Draw diagrams if necessary.**

1. Classify mycoses. Describe the pathogenesis and laboratory diagnosis of dermatophytosis.
(4+3+8 = 15 marks)

2. Describe the pathogenesis and laboratory diagnosis of Influenza virus infection. Write the difference between Antigenic shift and drift.
(5+5+5 = 15 marks)

3. **Write briefly on the followings:**
 - 3A. Pathogenesis and Lab diagnosis of Zygomycosis
 - 3B. Life cycle and pathogenesis of Anchylostoma duodenale
 - 3C. Paragonimus westermani
 - 3D. Morphology and Pathogenesis of Rabies virus
 - 3E. Laboratory diagnosis of Malaria
 - 3F. Mycetisms
 - 3G. Hydatid cyst(5 marks × 7 = 35 marks)

4. **Write short notes on:**
 - 4A. Eggs of Ascaris lumbricoides
 - 4B. SDA
 - 4C. LPCB Mount
 - 4D. Adenovirus infections
 - 4E. NIH swab(3 marks × 5 = 15 marks)

