

# Question Paper

Exam Date & Time: 19-Jan-2021 (10:00 AM - 01:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER MASTER OF SCIENCE (AUDIOLOGY) DEGREE EXAMINATION - JANUARY 2021  
SUBJECT: MAU 601 - TECHNOLOGY IN AUDIOLOGY  
(2018 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- |     |   |      |
|-----|---|------|
| 1)  | Explain calibration and maintenance of audiometers.                                   | (20) |
| 2)  | Write an essay on tele-technology. Discuss its applications in audiology.             | (20) |
| 3A) | Explain principle of fMRI. Discuss applications of fMRI in hearing sciences.          | (10) |
| 3B) | Write an essay on intra-operative monitoring of sensory functions.                    | (10) |
| 3C) | Write an essay on communication systems.  | (10) |
| 3D) | Discuss role of software packages for assessment and management of hearing disorders. | (10) |
| 4A) | Describe principal and methods of digital signal processing.                          | (5)  |
| 4B) | Explain characteristics of stimuli used in audiology.                                 | (5)  |
| 4C) | Describe methods for estimation of fundamental frequency.                             | (5)  |
| 4D) | Write a short note on artificial neural networks.                                     | (5)  |

-----End-----

# Question Paper

Exam Date & Time: 21-Jan-2021 (10:00 AM - 01:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER M.Sc IN AUDIOLOGY) DEGREE EXAMINATION - JANUARY 2021  
SUBJECT: MAU 603 - COCHLEAR PHYSIOLOGY  
(2018 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- |     |  |      |
|-----|--|------|
| 1)  | Write in detail on Hair cell physiology              | (20) |
| 2)  | Highlights the clinical Application of OAEs          | (20) |
| 3A) | With the neat diagram explain innervation of cochlea | (10) |
| 3B) | Write a note on Outer hair cell physiology           | (10) |
| 3C) | Phylogenetic development of cochlea                  | (10) |
| 3D) | Cochlear Microphonic                                 | (10) |
| 4A) | Basilar Membrane                                     | (5)  |
| 4B) | Suppression of OAES                                  | (5)  |
| 4C) | Non-Mammalian Cochlea                                | (5)  |
| 4D) | Factors affecting ECoChG                             | (5)  |

-----End-----

# Question Paper

Exam Date & Time: 23-Jan-2021 (10:00 AM - 01:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER M.O.T./ M.Sc. M.L.T./ M. Opt./ M.Sc. R.T./ M.Sc. ECOCARDIOGRAPHY/M.Sc. CC&IT /M.Sc. M.I.T./M.P.T./M.Sc. E.S.S./ M.Sc. N.M.T./ M.Sc. M.R.P./ M.Sc. RRT&DT/M.Sc. PFT/M.Sc. AUDIOLOGY/M.Sc. (S.L.P.)  
DEGREE EXAMINATION - JANUARY 2021

SUBJECT: RES 601 - BIOSTATISTICS & RESEARCH METHODOLOGY/RESEARCH METHODOLOGY & BIOSTATISTICS/ADVANCED BIOSTATISTICS & RESEARCH METHODOLOGY/RESEARCH METHODS, EPIDEMIOLOGY & STATISTICS  
(2018 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- 1) Erythrocyte Sedimentation Rate (ESR) readings (in mm) of 12 tuberculosis patients are given (8)  
below:  
12 8 11 9 8 14 8 12 8 9 11 10  
Calculate coefficient of variation.

2. Differentiate between the following:

- 2A) Ordinal variables and nominal variables. (4)  
2B) Sampling and non-sampling errors. (4)  
2C) P value and level of significance. (4)  
2D) Parameter and statistic. (4)

3. Explain the following with an example:

- 3A) The model used in logistic regression and interpretation of its coefficients. (4)  
3B) Use of predictive values in validation of a diagnostic test. (4)

- 4) Clearly stating the assumptions and hypothesis, describe paired t test and its non-parametric analogue test. (8)  
5) Illustrate the procedure of selecting a sample using simple random sampling. Enumerate its uses and limitations. (6)  
6) Describe the importance of review of literature in the development of a research protocol. (5)  
7) With the help of a schematic diagram explain prospective cohort study design and its analysis. (10)  
8) Differentiate between simple and stratified randomization methods with suitable examples. (6)

9. A random sample of 61 individuals from a population contained 20 smokers.

- 9A) What is the standard error of proportion of smokers? (1)

- 9B) Construct a 95% confidence interval for the population prevalence. (3)
- 9C) Give the margin of error. (1)
- 10) 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 of error of 1.2 kg? Assume that a reasonable estimate of the population standard deviation is 5 kg. (4)
- 11) An epidemiologist compared in a pilot study, a sample of 100 adults suffering from a certain neurologic disease to a sample of 100 comparable controls who were free of the disease. 50 of the adults with the disease and 25 of the controls were involved in industries using a specific chemical. Assuming that the proportion employed in these industries in the entire population is similar to that observed in the pilot study, how many subjects should be studied in each of the two groups to have 80% power of detecting the true difference between the groups if the hypothesis is tested at 5% level? (4)
- 12) Define correlation and give two examples of each of positive and negative correlation. State the range of Pearson's correlation coefficient. (6)
- 13A) Given the mean and standard deviation of weight of new born babies are 2.8 kg and 0.5 kg respectively. Assuming normality, construct the reference range. (2)
- 13B) Draw the normal distribution curve and list its properties. (4)
- 14) Nine laboratory animals were infected with a certain bacterium and then immune-suppressed. The mean number of organisms later recovered from tissue specimens was 6.5 with a standard deviation of 0.6. Can one conclude from these data that the population mean is different from 6? What assumptions are necessary? (8)  
[ $\alpha = 0.05$ ,  $t_{1 - \alpha/2} (8) = 2.31$ ]

-----End-----

# Question Paper

Exam Date & Time: 25-Jan-2021 (10:00 AM - 01:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER M.Sc. IN AUDIOLOGY DEGREE EXAMINATION - JANUARY 2021  
SUBJECT: MAU 605 - NEUROPHYSIOLOGY OF HEARING  
(2018 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- |     |  |      |
|-----|--|------|
| 1)  | Explain action potential and its characteristics in detail.                  | (20) |
| 2)  | Explain localization of auditory sound sources at brainstem level.           | (20) |
| 3A) | Frequency coding in the auditory nerve.                                      | (10) |
| 3B) | Functions of neurotransmitters and neuromodulator.                           | (10) |
| 3C) | MOC efferent fibres and their role in hearing.                               | (10) |
| 3D) | Explain cellular organization and tonotopic organization in auditory cortex. | (10) |
| 4A) | Secondary auditory cortex.   | (5)  |
| 4B) | Anatomy of Inferior colliculus.  | (5)  |
| 4C) | Graded potentials.   | (5)  |
| 4D) | Anatomy of internal auditory meatus.   | (5)  |

-----End-----

# Question Paper

Exam Date & Time: 27-Jan-2021 (10:00 AM - 01:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER M.Sc (AUDIOLOGY) DEGREE EXAMINATION - JANUARY 2021  
SUBJECT: MAU 607 - HEARING SCIENCES  
(2018 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

Draw diagrams wherever necessary

- |     |  |      |
|-----|--|------|
| 1)  | Write in detail about the applications of theory of signal detection             | (20) |
| 2)  | Write an essay on methods to assess frequency resolution.                        | (20) |
| 3A) | Explain the temporal theory of pitch perception                                  | (10) |
| 3B) | Describe the method to measure MAP & MAF   | (10) |
| 3C) | What are the stimulus related factors affecting loudness perception?             | (10) |
| 3D) | Write an essay non-simultaneous masking  | (10) |
| 4A) | Write a note on phon and sone.   | (5)  |
| 4B) | What is equal loudness contour? Describe it's characteristics                    | (5)  |
| 4C) | With appropriate example, explain the concept of sensitivity and criterion point | (5)  |
| 4D) | What are the effects of frequency and intensity on DLI?                          | (5)  |

-----End-----