Question Paper

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.)/ M.Sc. H.I.M./ M.Sc. CLINICAL PSYCHOLOGY DEGREE EXAMINATION - MARCH 2021
SUBJECT: RES 601 - BIOSTATISTICS & RESEARCH METHODOLOGY/RESEARCH METHODOLOGY & BIOSTATISTICS/ADVANCED BIOSTATISTICS & RESEARCH METHODOLOGY/RESEARCH METHODS, EPIDEMIOLOGY & STATISTICS/BIOSTATISTICS
(2018 SCHEME)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1A)	List the uses of statistics in health science research.	(3)
1B)	Systolic Blood Pressure values of 12 subjects are given below. Compute the quartiles and the inter quartile range. SBP(mmHg): 162, 138, 146, 126, 134, 142, 150, 144, 130, 170, 138, 154.	(7)
2A)	Describe the characteristics of various scales of measurement with one example each.	(5)
2B)	Mean and standard deviation of systolic Blood Pressure of a group of adults is 140 mmHg and 10 mmHg and that of weight is 70 Kg and 5 Kg respectively. Find out which characteristic is more consistent.	(5)
3A)	Give the expression for standard error of the following: i) Sample proportion. ii) Difference in sample mean.	(4)
3B)	The height of adult males in a population are normally distributed with a mean of 170 cm and a standard deviation of 8 cm. In a random sample of 64 adults from the population: i) What is the probability that the mean height is less than 169 cms? ii) What is the probability that the mean height is between 169 and 172 cms?	(6)
4A)	Explain skewness and kurtosis.	(5)
4B)	A researcher is interested in obtaining an estimate of the average level of some enzyme in a certain human population. He takes a sample of 36 individuals, determines the level of the enzyme in each, and computes the sample mean, which is equal to 42. It is known that the variable of interest is approximately normally distributed with a variance of 64. Compute the 95% confidence interval for population mean (Z=1.96).	(5)

5. **Answer the following:**

5A)	Differentiate Type I Error and Type II Error.	(2)
5B)	Explain the situation with example, assumption and the hypothesis tested with two independent sample t-test.	(6)
5C)	Give the situation for the use of: i) Bland Altman plot.	(2)

ii) Kappa statistic.

6A)	Explain the design of Randomized Controlled Trial with an example and flow diagram.	(5)
6B)	Following is the data collected for the validation of a new test. Compute the sensitivity, specificity, positive predictive value and negative predictive value of the new test.	(5)

	Disease	
	Present	Absent
Test +ve	180	50
Test - ve	20	200

7A)	Study the association between Cirrhosis of the liver and Alcoholism, applying chi-square test (Chi-Square critical value for 1 df and 5% level of significance=3.84)	(5)

Alcoholic	Cirrhosis of the liver	
	Present	Absent
Yes	170	50
No	30	100
	200	150

7B)	A health planning agency wishes to know for a certain geographical region, what proportion of adults aged 60-70 years are diabetic. Find the necessary minimum sample size to construct a 95% confidence interval for P with a margin of error not exceeding 0.1, assuming that prior studies suggest that proportion of diabetic is about 0.3. (Z=1.96)	(5)
8A)	What are non-sampling errors? How do we control them?	(5)
8B)	Explain stratified random sampling techniques with example.	(5)
9A)	Give the non-parametric analogue of t- test, Paired t- test, one-way ANOVA and repeated measures ANOVA.	(5)
9B)	Explain the use of scatter diagram with sketch.	(5)
10A)	List the advantages and limitations of case-control study.	(5)
10B)	Explain the materials and methods section of a research protocol.	(5)

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Question Paper

MANIPAL ACADEMY OF HIGHER EDUCATION

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

Marks: 100   **Duration: 180 mins.**

Answer all the questions.

1)	Explain working principle of CT and MRI. Discuss its application in diagnosis and management of hearing disorders.	(20)
2)	Write an essay on tele-technology in audiology.	(20)
3A)	Explain working principle of EEG.	(10)
3B)	Describe calibration of stimuli in AEP systems.	(10)
3C)	Discuss role of software packages in audiology.	(10)
3D)	Discuss importance and benefits of intra-operative monitoring.	(10)
4A)	Explain transmission and reception of AM and FM signals.	(5)
4B)	Describe characteristics of transducers used in audiology.	(5)
4C)	Compare and contrast speaker and speech recognition systems.	(5)
4D)	Discuss the applications of artificial neural networks	(5)

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Question Paper

MANIPAL ACADEMY OF HIGHER EDUCATION

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

Marks: 100   **Duration: 180 mins.**

Answer all the questions.

1)	Enumerate the structures in the Organ of Corti with a neat diagram.	(20)
2)	Describe the classification of OAEs based on taxonomies and their clinical implications.	(20)
3A)	Explain the development of inner ear	(10)
3B)	Elaborate on the protocol for recording ECochG and its interpretation	(10)
3C)	Describe the physiology of auditory system in non-mammalian species.	(10)
3D)	Justify the role of Prestin in outer hair cell motility	(10)

4. **Write short notes on:**

4A)	Diagnosis of Meniere's disease based on ECochG	(5)
4B)	Cochlear microphonics	(5)
4C)	Outer hair cells vs Inner hair cells	(5)
4D)	Depolarisation	(5)

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Question Paper

MANIPAL ACADEMY OF HIGHER EDUCATION

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

Marks: 100   **Duration: 180 mins.**

Answer all the questions.

1)	Explain critical band concept. Discuss various methods and procedure to derive critical bandwidth and shape.	(20)
2)	Explain adaptive psychophysical methods and explain its importance over classical method	(20)
3A)	Explain in detail the application of theory of signal detection	(10)
3B)	Explain theories of pitch perception	(10)
3C)	Discuss factors affecting pitch perception	(10)
3D)	Compare the loudness and pitch perception in cochlear hearing loss and normal hearing individuals	(10)
4A)	Forced choice method	(5)
4B)	Psychophysical tuning curve	(5)
4C)	DLI DLF	(5)
4D)	loudness recruitment	(5)

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