Total No. of printed pages = 6

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Roll No. of candidate | | | | | | | | | | |

2021

B.Pharm. 8th Semester (Regular) End-Term Examination

BIOSTATISTICS AND RESEARCH METHODOLOGY (Theory)

(New Regulation w.e.f 2017 – 18)

Full Marks – 75 Time – Three hours

The figures in the margin indicate full marks
for the questions.

1. Multiple choice questions (MCQ) (Answer all questions): $(20 \times 1 = 20)$

   (i) The sum of the deviation about mean for the data 6,8,10, 2 and 4 is always

   (a) 1

   (b) 0

   (c) Negative

   (d) 30

   (ii) In testing hypothesis we use different level of significance to test Ho, in most situations level of significance is not given then we have to use;

   (a) 1%

   (b) 2%

   (c) 5%

   (d) 10%

   (iii) A variable which has some chance or probability of its occurrence is known as

   (a) Simple variable

   (b) Qualitative variable

   (c) Quantitative variable

   (d) Random variable

[Turn over

(iv) If we want to compare two or more groups then we use coefficient of variation (C.V), the group which has maximum C.V. is known as the more;

(a) Consistent

(b) Not consistent

(c) It is not possible

(d) None of the above

(v) In a binomial distribution, if 'n' is the number of trials and 'p' is the probability of success, then the mean value is given by:

(a) np

(b) n

(c) p

(d) $np\ (1 - p)$

(vi) It is suitable to use binomial distribution only for

(a) Large values of 'n'

(b) Fractional values of 'n'

(c) Small values of 'n'

(d) Any values of 'n'

(vii) For larger values of 'n' binomial distribution

(a) loses its discreteness

(b) tends to poisson distribution

(c) stays as it is

(d) gives oscillatory values

(viii) Binomial distribution is a

(a) Continuous distribution

(b) Discrete distribution

(c) Irregular distribution

(d) Not a probability distribution

(ix) What symbol represents the test statistic for the Mann-Whitney test?

(a) Ws

(b) T

(c) U

(d) H

(x) Assuming the assumptions of parametric tests are met, non-parametric tests, compared to their parametric counterparts

(a) Are more conservative

(b) Are all of these

(c) Are less likely to accept the alternative hypothesis

(d) Have less statistical power

(xi) ANOVA is a statistical method of comparing the several populations

(a) Means

(b) Variances

(c) Standard deviation

(d) None of the above

(xii) The ———————— sum of squares measures the variability of the observed values around their respective treatment means

(a) Error

(b) Total

(c) Treatment

(d) Interaction

(xiii) When conducting an ANOVA, FDATA will always fall within what range

(a) Between 0 and infinity

(b) Between 0 and 1

(c) Between negative infinity and infinity

(d) Between 1 and infinity

(xiv) If FDATA = 5, the result is statistically significant

(a) Sometimes

(b) Always

(c) Never

(d) None of the above

(xv) In one way ANOVA, with usual notation the error degrees of freedom is

(a) $n - 1$

(b) $n - k$

(c) $k - 1$

(d) $k - n$

(xvi) The objective of RSM is to

(a) Maximize the response

(b) Minimize the response

(c) Optimize the response

(d) Neglect the response

(xvii) Which of these can be used to develop a new process?

(a) Design of experiments

(b) Acceptance sampling

(c) Control charts

(d) Histogram

(xviii) The design of experiment is used to determine the variables which are ———————— affecting the state of the process.

(a) The most

(b) The least

(c) Not changing

(d) None of the above

(xix) What are the factors in a factorial design?

(a) The independent variables

(b) The dependent variables

(c) The organismic variables

(d) The experimental variables

(xx) During experimental design, a variable is defined as

(a) Treatment

(b) Factor

(c) Variance

(d) None of the above

2. Short answers (Answer *seven* out of nine) : $(7 \times 5 = 35)$

(a) Explain with an example frequency distribution in statistics. (5)

(b) How to calculate Karl Pearson's coefficient of correlation? (5)

(c) What are regression equations? How do you calculate regression analysis? (5)

(d) Explain binomial distribution with an example. (5)

(e) Write the difference between normal distribution and Poisson's distribution. (5)

(f) Explain the significance of null hypothesis. What is alternative hypothesis? (5)

(g) Discuss Wilcoxon Rank Sum Test. (5)

(h) What is a designed experiment? Outline the process involved in experimental design. (5)

(i) Discuss the method of full factorial design. (5)

3. Long answers (Answer *two* out of three) $(2 \times 10 = 20)$

(a) What are the methods of curve fitting? Explain the least square method of curve fitting.

(b) Distinguish between one way and two ways ANOVA. Explain the role of ANOVA in hypothesis testing with an example.

(c) Explain the role of response surface methodology in the design of experiments and formulation optimization.

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