

**EXAMINATION PAPER**

**FACULTY : COMPUTER SCIENCE AND MULTIMEDIA**

**COURSE : BACHELOR OF INFORMATION TECHNOLOGY (HONS)**

**YEAR/SEMESTER : SECOND YEAR / SEMESTER FOUR**

**MODULE TITLE : QUANTITATIVE METHODS**

**CODE : BIT 125**

**DATE : SEPTEMBER 16- 2018, SUNDAY**

**TIME ALLOWED : 3 HOURS**

**START : 1:00 PM FINISH : 4:00 PM**

**Instruction to candidates**

1. This question paper has THREE (3) Section
2. Answer **ALL** questions in Section A, MCQ.
3. Answer **5** questions in Section B, MSAQ.
4. Answer **2** questions in Section C, MEQ.
5. No scripts or answer sheets are to be taken out of the Examination Hall.
6. For Section A, answer in the OMR form provided.

***Do not open this question paper until instructed***

**SECTION A**

**Multiple Choice Questions (30\*1=30)**

1. **For Binomial distribution with number of trials n and probability of success p, the relation between mean and variance that hold is:**
2. Mean ≠ variance
3. Mean ≥ variance
4. Mean ≤ variance
5. Mean ˃ variance
6. **In normal distribution,:**
7. Mean, median and mode are equal
8. Mean, median and mode are not equal
9. Mean is always greater than variance
10. Mode is always less than mean
11. **A random variable which takes the values within certain range is called:**
12. Discrete random variable
13. Continuous random variable
14. Mixed random variable
15. Qualitative random variable
16. **In which theoretical probability distribution mean and variance are equal:**
17. Binomial
18. Normal
19. Poison
20. All of above
21. **In regression line Y= a + b X, a is called the:**
22. Constant term
23. Dependent variable
24. Regression coefficient of Y on X
25. Slope of line
26. **Value of correlation coefficient lies between:**
27. - ∞ to ∞
28. - ∞ to 1
29. -1 to 1
30. 0 to 1
31. **Correlation coefficient search for:**
32. Relationship between two variables
33. Effectiveness of two variables
34. Sufficiency between two variables
35. None of the above
36. **If X and Y are two variates, there can be at most:**
37. One regression line
38. Two regression lines
39. Three regression lines
40. An infinite number of regression lines
41. **Test of hypothesis H0: µ=70 vs H1: µ≠70 leads to:**
42. Left-tailed test
43. Right-tailed test
44. Two-tailed test
45. None of the above
46. **Hypothesis of no significance difference between true parameter and hypothesized parameter refers to:**
47. Alternative hypothesis
48. Estimation
49. Null hypothesis
50. Probability distribution
51. **Student’s t-test is applicable when:**
52. The sample size is less than 30 and population sd is unknown
53. The sample size is more than 30 and population sd is unknown
54. The sample size is less than 30 and population sd is known
55. The sample size is more than 30 and population sd is known
56. **Formula for determine sample size(n) is given by:**
57. **Coefficient of determination in regression analysis measures:**
58. Variation in independent variable due to dependent variables
59. Variation in dependent variable due to independent variables
60. Association between two variables
61. Independency of two variables
62. **Whether a test is one-tailed or two-tailed depends on:**
63. Null hypothesis
64. Alternative hypothesis
65. Simple hypothesis
66. Composite hypothesis
67. **Parameters are those measure which describes the characteristics of :**
    1. Population
    2. Sample
    3. A formula
    4. None of the above
68. **Given that P(B)= 0.4 and P(A∩B)=0.2, probability P( ) is equal to**
69. 0.4
70. 0.7
71. 0.5
72. 0.15
73. **With help of histogram we can prepare:**
74. Frequency curve
75. Ogive curve
76. Pie chart
77. Line

1. **Parameter of poison probability distribution is:**
2. Mode
3. Standard deviation
4. Mean per unit time
5. Variance
6. **Binomial probability distribution refers to:**
7. Continuous probability distribution
8. Discrete probability distribution
9. Mixed probability distribution
10. All of the above
11. **Independent events are those events which are :**
12. Related with each-other
13. Not occur simultaneously
14. Complimentary to each-other
15. Not related with each-other
16. **Variance of binomial distribution is equal to:**
17. np
18. npq
19. nq
20. p+q
21. **If A and B are two events, the probability of at least one of them can occur is given as:**
22. P (A∩B)
23. P(AB)
24. P(A) P(B)
25. P(A ∩ )
26. **In regression line of Y on X, the variable X is known as :**
27. Dependent variable
28. Independent variable
29. Explained variable
30. None of the above
31. **Which of the following relations among the location parameters does not hold?**
32. Q2=median
33. P50=median
34. D5=median
35. D6=median
36. **Parameters of normal distribution are :**
37. Mean and variance
38. Mean and standard deviation
39. Mean and mode
40. Mean and median
41. **Which measure of dispersion has a different unit other than the unit of measurement of values:**
42. Range
43. First quartile
44. Standard deviation
45. Variance
46. **Bayes’ theorem is applied to calculate:**
47. Unconditional probability
48. Revised probability
49. Joint probability
50. Marginal probability
51. **Simple interest can be calculated as:**
52. p×n×i
53. p×n
54. p×i
55. p
56. **The probability of the intersection of two mutually exclusive events is always:**
57. Infinity
58. Zero
59. One
60. None of the above
61. **Standard error of sample mean measures:**
62. Deviation of observations
63. Deviation of sample means
64. Average of observations
65. Average of sample means

**SECTION B**

**Short Answers Questions**

**Answer any five (5) questions out of Eight (8) questions (5\*6=30)**

1. The probability that an integrated circuit chip will have defective etching is 0.12, the probability that it will have a crack defect is 0.29, and the probability that is has both defects is 0.07. (2\*3)
   1. What is the probability that a newly manufactured chip will have either an etching or a crack defects?
   2. What is the probability that a newly manufactured chip will have only one defect?
2. A student has received a Rs 50000 loan from a wealthy aunt in order to finance his 4- year college prograṃ. The terms are that the student repays his aunt in full at the end of 8 years with simple interest computed at a rate of 5 percent per yeaṛ. Determine the interest which must be paid on the 8- year loaṇ
3. If 90% of all students taking a beginning computer programming course fail to get their first Program to run on first submission, what is the probability that among 10 randomly chosen such students(2\*3)
   1. At least 12 fail on first submission
   2. At most two get their program to run properly on first submission
4. In a certain assembly plant, three machines B1, B2, and B3 make 30%, 45% and 25% respectively of the product. It is known from past experience that 2%, 3% and 2% of the products made by each machine, respectively, are defective. If a product were chosen randomly and found to be defective, what is the probability that it was made by machine B3?
5. Ten cartons are taken at random from an automatic filling machine. The mean net weight of the 10 cartons is 11.8 oz and standard deviation is 0.15 oz. Does the sample mean differ significantly from the intended weight of 12 oz?
6. A sample of 100 light bulbs from a manufacturing lot had average life of 1416 hour with standard deviation on 30 hours (2\*3)
7. Calculate the standard deviation of mean.
8. Set up 90% confidence limits for true population mean.
9. In a test administered to500 students, the average score was 42 and standard deviation 24. Find (2+2+2)
   1. The number of students exceeding a score 50
   2. The number of students lying between 32 and 54
   3. The probability that student get mark less than 60
10. An analysis of monthly wages paid to the workers in two firms A and B belonging to the same industry gives the following results**(1.5+1.5+3)**

Firm A Firm B

Number of worker: 50 60

Average monthly wages in $: 210 175

Variance of distribution of wage: 81 100

1. Which firm, A or B, has a large wage bill?
2. In which firm, A or B is there grater variability in wage?
3. Calculate combined mean wage of firm A and firm B.

**SECTION C**

**Long Answer Questions**

**Attempt any two (2) questions out of three (3) questions. (2\*20=40)**

1. A tire manufacturing company is interested in removing pollutants from the exhaust at the factory and cost is a concern. The company has collected data from other companies concerning the amount of money spent on environmental measures and the resulting amount of dangerous pollutants released ( as a percentage of total emissions)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Money spent | 10 | 12 | 8 | 15 | 9 | 11 | 8 |
| % of dangerous pollutants | 11 | 15 | 3 | 18 | 10 | 12 | 6 |

1. Compute correlation coefficient between money spent and % of dangerous pollutants ant interpret its meaning. (4)
2. Develop the estimating equation to predict money spent from percentage of Dangerous pollutants and hence compute the residual for money spent of $1500.(5)
3. Predict money spent when % of dangerous pollutants is 14. (4)
4. Calculate the standard error of estimate and interpret the result.(3)
5. What percent of the total variation in money spent is explained by percent of Dangerous pollutants?(4)
6. Ten objects are chosen on random from the large population and their weights are found to be in gms60, 63, 64, 65, 66, 68, 69, 70, 70 and 71.
7. Compute sample mean weight and sample standard deviation. (6)
8. Compute standard error of estimate. (4)
9. Construct 95% fudicial limits for the population mean weight. (5)
10. In the light above that, test the hypothesis that the mean weight in the universe is 65 gms at α=5%. (5)
11. Following are the marks distribution of students in a college.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
| No of Students | 5 | 15 | 20 | 35 | 10 | 5 |

Find the following:

1. Mean marks of the distribution(3)
2. Median mark of the distribution(3)
3. The minimum pass marks if only 32% of the students had failed(3)
4. The percentage of students getting marks more than 75. (4)
5. Construct histogram and locate mode (3)
6. Coefficient of quartile deviation (4)

**\*\*\*\*BEST OF LUCK\*\*\*\***