

**Shivaji Univeristy, Kolhapur**  
**Department of Statistics**  
M. Sc. Statistics/Applied Statistics and Informatics  
Practice Questions

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- 01 Operator *not in* Python .....
- A) Returns True if both variables are the same object
  - B) Returns True if both variables are not the same object
  - C) Returns True if a sequence with the specified value is present in the object
  - D) Returns True if a sequence with the specified value is not present in the object
- 02 Which of the following statement(s) is/are true
- i) Tuple cannot allow duplicate values
  - ii) List can allow duplicate values
- A) Both i) and ii) are true
  - B) Only i) is true
  - C) Only ii) is true
  - D) Both i) and ii) are not true
- 03 Consider the following code in Python.
- ```
d={"a":85, "b":90,"c":95,"d":98}
```
- Then command ..... is used to access the value associated with key *a*.
- A) d.a
  - B) d['a']
  - C) d[a]
  - D) d{a}
- 04 Python command to generate matrix of random element between 0-99 of order 10x2
- A) `numpy.random.randint(100, size=(10,2))`
  - B) `numpy.random (100, size=(10,2))`
  - C) `numpy. randint (100, size=(10,2))`
  - D) None of the above
- 05 Which of the following is a way to import the *pandas* module in your program?
- i) `import pandas`
  - ii) `import pandas as p`
  - iii) `from pandas import *`
- A) Only i)
  - B) Only i) and ii)
  - C) Only ii)
  - D) All i), ii) and iii)
- 06 Let  $X \sim N(10,1)$ . Which of the following command is used to find *k* such that  $P(X \leq k) = 0.75$ ?
- A)
  - B)
  - C)
  - D) `from scipy.stats import norm`  
`norm.rvs(0.75, 10, 1)`
- 07 Which of the following statement(s) is/are true?
- i) TF measures how frequently a term occurs in a document

- ii) IDF measures how important a term is.
- A) Both i) and ii) are true  
 B) Only i) is true  
 C) Only ii) is true  
 D) Both i) and ii) are not true
- 08 In case of classification problem, which of the following command is used to split data (X and y) in training and testing group
- A) `from sklearn.model_selection import train_test`  
`X_train, X_test, y_train, y_test = train_test(X, y, test_size=0.4)`  
 B) `import sklearn`  
`X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.4)`  
 C) `from sklearn.model_selection import train_test_split`  
`X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.4)`  
 D) None of the above
- 09 Read the statements given below. Identify the right option from the following for pie chart.
- Statement A: To make a pie chart with Matplotlib, we can use the `plt.pie()` function.  
 Statement B: The `autopct` parameter allows us to display the percentage value using the Python string formatting.
- A) Statement A is correct  
 B) Statement B is correct  
 C) Both the statements are correct  
 D) Both the statements are wrong
- 10 Which of the following statement(s) is/are true?
- i) `set()` function in python can be used to obtain the count of total number of tokens in any text  
 ii) `len()` function can be used to obtain the vocabulary items of any text
- A) Statement A is correct  
 B) Statement B is correct  
 C) Both the statements are correct  
 D) Both the statements are wrong
- 11 How to read grayscale image in python through OpenCV library.
- A) `cv2.imread(Image Path, 0)`  
 B) `cv2.imread(Image Path, -1)`  
 C) `cv2.imread(Image Path, 1)`  
 D) `cv2.imread(Image Path)`
- 12 Which of the following statement(s) is/are true?
- i) Erosion is one of the fundamental in image thresholding  
 ii) Morphological transformation are used to convert images to colour image
- A) Statement A is correct  
 B) Statement B is correct  
 C) Both the statements are correct  
 D) Both the statements are wrong
- 13 Let T: the age at which children are able to count from 1-10 at school. Student C did not able to count from 1-10 at the end of study. What kind of observation is?
- A) Left censored  
 B) Right censored

- C) Interval censored  
D) Uncensored
- 14 Assume that life time of components has  $U(0,10)$  distribution. Let 20 identical components were put on test and experiment conducted with type-I censoring scheme with 7 as a censoring time. If  $R$  denotes the number of censored observation then expected value of  $R$  is .....
- A) 3  
B) 6  
C) 10  
D) 14
- 15 Suppose experimenter puts 10 identical units on test. Life time of units follows  $E(\lambda)$  distribution, where  $\lambda$  is rate parameter. First failure is observed at time 2, immediately after observing the first failure experimenter removes 2 of the working units at random from the study. Second failure is observed at time 4, immediately after the second failure experimenter removes 3 of the working units at random from the study. Third failure is observed at time 8, immediately after observing the third failure experimenter removes all the remaining working units from the study and concluded the experiment. Then the MLE of  $\lambda$  is .....
- A)  $3/46$   
B)  $10/46$   
C)  $3/14$   
D)  $10/14$
- 16 Assume lifetimes are  $U(0, \theta)$ . An experimenter observed that of the 4 units put on test, first failure was at 2, second failure was at 5, next two failures were during  $(6, 7]$ . Then the likelihood function of  $\theta$  is proportional to.....
- A)  $\frac{1}{\theta}$   
B)  $\frac{1}{\theta^2}$   
C)  $\frac{1}{\theta^3}$   
D)  $\frac{1}{\theta^4}$
- 17 Five components labelled with  $C_1, C_2, \dots, C_5$  were put on the test and their failures times are 5, 3, 8, 2, 10 respectively. Then risk set at time 3.5 is ....
- A)  $\{C_3, C_4, C_5\}$   
B)  $\{C_2, C_3, C_4, C_5\}$   
C)  $\{C_1, C_3, C_5\}$   
D)  $\{C_4, C_5\}$
- 18 Let 1, 2+, 3 be the observed failure/censoring times of three components on test. KM estimate of survival function at 2.2 is ...
- A) 0  
B)  $1/3$   
C)  $2/3$   
D) 1
- 19 The scaled TTT transform of  $U(0, \theta)$  distribution is
- A)  $2t \left(1 - \frac{t}{2}\right)$   
B)  $\left(1 - \frac{t}{2}\right)$   
C)  $\theta t$   
D)  $\frac{t}{\theta}$
- 20 Linear Programming Problem must have an

- A) Linear objective function  
 B) Linear constraints  
 C) Non negative decision variables  
 D) All of the above
- 21 Which of the following is not correct  
 A) Associated with every LPP, there is always another LPP which is based on the same data and having same solution  
 B) Given LPP is called primal while associated LPP is called its dual  
 C) It is necessary to convert the inequality constraint into equality constraints for writing the dual an LPP  
 D) Dual of dual is primal
- 22 What is not a solution to the following LPP  
 Max  $Z = x_1 + x_2$ ,  
 Subject to,  
 $x_1 + 2x_2 \leq 4$ ,  
 $3x_1 + 2x_2 \leq 10$ ,  
 $x_1 \geq 0, x_2 \geq 0$
- A)  $x_1 = 0, x_2 = 2$   
 B)  $x_1 = 2, x_2 = 1$   
 C)  $x_1 = 2, x_2 = 1$   
 D)  $x_1 = 2, x_2 = 2$
- 23 Dual has unbounded solution then primal has  
 A) Unique feasible solution.  
 B) Optimal solution.  
 C) Infeasible solution  
 D) None of the above
- 24 Post optimal analysis is technique to  
 A) Determine how optimum solution to an LPP changes in response to problem inputs  
 B) Allocate resources optimally  
 C) Minimize cost operations  
 D) Spell out the relation between dual and its primal
- 25 Which of the following is correct  
 A) A linear programming problem with only one decision variable restricted to integer value is not an integer programming problem.  
 B) An integer programming problem is an LLP with all decision variable are restricted to integers  
 C) Pure IPP is one where all decision variable are restricted to integers  
 D) None of the above
- 26 The zero –one programming problem requires  
 A) Decision variables to have values either 0 or 1.  
 B) The decision variables have coefficients between 0 and 1.  
 C) All constraints have coefficients between 0 and 1.  
 D) All of the above
- 27 Given a system of  $m$  simultaneous linear equations with  $n$  unknowns ( $m < n$ ). The number of basic variables will be  
 A)  $m$   
 B)  $n$   
 C)  $n-m$

- 28 D) None of these  
 If  $X'QX$  is positive semi definite then, it is  
 A) Strictly convex  
 B) Strictly concave  
 C) Convex  
 D) Concave
- 29 In two person zero sum game is said to be fair if  
 A) The upper value and lower value of the game are not equal  
 B) The upper value is more than lower value of the game  
 C) The upper value and lower value of the game are same and equal to zero.  
 D) None of the above
- 30 A minimax and maximin values of the game are same, then  
 A) There is saddle point  
 B) Solution does not exists  
 C) Strategies are mixed  
 D) None of the above
- 31 Mixed strategies of the game can be solved by  
 A) Matrix method  
 B) Algebraic method  
 C) Graphical method  
 D) All of the above
- 32 The QPP is NLPP with quadratic objective function and  
 A) Linear inequality constraints  
 B) Non-linear inequality constraints  
 C) Non-linear equality constraints  
 D) No constraints
- 33 Solution to the LPP must satisfy?  
 A) All constrains  
 B) non negativity constrains  
 C) both (a) and (b)  
 D) Neither (a) nor (b)
- 34 If primal problem has unbounded feasible solution then corresponding dual has  
 A) Unbounded feasible solution  
 B) Optimum feasible solution  
 C) No feasible solution  
 D) None of the above
- 35 The key assumption made in generalized linear models is .....  
 A) response distribution belongs to Cramer family  
 B) response distribution is normal  
 C) response distribution belongs to exponential family  
 D) response distribution is binomial
- 36 For response distribution is gamma then ..... link is used.  
 A) logit  
 B) complementary log log  
 C) power family  
 D) reciprocal
- 37 Which of the following is canonical link for binary response variable?  
 A) logit  
 B) probit  
 C) complementary log log

- 38 D) log  
In iterative reweighted least square method of ..... is used.
- A) Newton Raphson method  
B) 1<sup>st</sup> order Taylor series approximation  
C) numerical integration  
D) none of the a, b and c
- 39 ..... is called as saturated model.
- A) Model with all possible parameters  
B) Full model  
C) Model with one regressor  
D) Intermediate model
- 40 When response variable is count of events then ..... regression is used.
- A) logistic  
B) gamma  
C) classical  
D) Poisson
- 41 The R chart is used for which one of the following product or part characteristics?
- A) number of rejects in the sample  
B) number of reworked parts in a sample  
C) radius of a cylindrical part  
D) None of A, B, C
- 42 The Six Sigma programme was first implemented in .....
- A) Motorola  
B) General Electric  
C) Sony  
D) Ford
- 43 c-charts are based on the ....
- A) binomial distribution  
B) Erlang distribution  
C) normal distribution  
D) Poisson distribution
- 44 Average Total Inspection is defined as:
- A) Average of rejected lots and accepted lots  
B) Average number of units inspected per lot  
C) Average of rejected Lots  
D) Average of accepted Lots
- 45 In a double sampling plan, let  $d_1$  be the number of defects in the first sample and  $d_2$  be the number of defects in the second sample. Let  $c_2$  be the acceptance number for both samples. The condition for rejection is:
- A)  $D_1 + d_2 < c_2$   
B)  $D_1 + d_2 > c_2$   
C)  $D_1 * d_2 > c_2$   
D)  $D_1 * d_2 < c_2$
- 46 Machine wear and tear is .... source of variation.
- A) Random  
B) Natural  
C) Assignable  
D) Cannot be determined