## UNIVERSITY OF MYSORE Postgraduate Entrance Examination November - 2021



MAXIMUM MARKS : 50
MAXIMUM TIME : 75 MINUTES
(Including time for filling O.M.R. Answer sheet)

## INSTRUCTIONS TO THE CANDIDATES

1. The sealed question paper booklet containing 50 questions enclosed with O.M.R. Answer Sheet is given to you.
2. Verify whether the given question booklet is of the same subject which you have opted for examination.
3. Open the question paper seal carefully and take out the enclosed O.M.R. Answer Sheet outside the question booklet and fill up the general information in the O.M.R. Answer sheet. If you fail to fill up the details in the form as instructed, you will be personally responsible for consequences arising during evaluating your Answer Sheet.
4. During the examination:
a) Read each question carefully.
b) Determine the Most appropriate/correct answer from the four available choices given under each question.
c) Completely darken the relevant circle against the Question in the O.M.R. Answer Sheet. For example, in the question paper if "C" is correct answer for Question No.8, then darken against SI. No. 8 of O.M.R. Answer Sheet using Blue/Black Ball Point Pen as follows:

Question No. 8. (A) (B) (D) (Only example) (Use Ball Pen only)
5. Rough work should be done only on the blank space provided in the Question Booklet. Rough work should not be done on the O.M.R. Answer Sheet.
6. If more than one circle is darkened for a given question, such answer is treated as wrong and no mark will be given. See the example in the O.M.R. Sheet.
7. The candidate and the Room Supervisor should sign in the O.M.R. Sheet at the specified place.
8. Candidate should return the original O.M.R. Answer Sheet and the university copy to the Room Supervisor after the examination.
9. Candidate can carry the question booklet and the candidate copy of the O.M.R. Sheet.
10. The calculator, pager and mobile phone are not allowed inside the examination hall.
11. If a candidate is found committing malpractice, such a candidate shall not be considered for admission to the course and action against such candidate will be taken as per rules.
12. Candidates have to get qualified in the respective entrance examination by securing a minimum of 8 marks in case of SC/ST/Cat-I Candidates, 9 marks in case of OBC Candidates and 10 marks in case of other Candidates out of 50 marks.

## INSTRUCTIONS TO FILL UP THE O.M.R. SHEET

1. There is only one most appropriate/correct answer for each question.
2. For each question, only one circle must be darkened with BLUE or BLACK ball point pen only. Do not try to alter it.
3. Circle should be darkened completely so that the alphabet inside it is not visible.
4. Do not make any unnecessary marks on O.M.R. Sheet.
5. Mention the number of questions answered in the appropriate space provided in the O.M.R. sheet otherwise O.M.R. sheet will not be subjected for evaluation.

6. If $f(x)=2 x+1,0 \leq x \leq 1, B=[1,3]$ and $\mathrm{D}=(1 / 3,2 / 3]$ then $f(\mathrm{D})$ is
(A) $(5 / 100,3 / 7)$
(B) $(5 / 3,7 / 3]$
(C) $[3 / 5,5 / 7]$
(D) None
7. The limit of $\frac{1}{n+1}+\frac{1}{n+2}+\frac{1}{n+3}++++\frac{1}{2 n}$ is
(A) $\exp \{\log 5\}$
(B) $\log 2$
(C) n
(D) None
8. Which of the following is need not be true in a vector space?
(A) It is closed under vector addition.
(B) It is closed under scalar multiplication.
(C) It is closed under vector multiplication.
(D) It is closed under linear combinations of vectors.
9. What is the rank of the matrix $Y$ ? where $Y=\left[\begin{array}{lll}1 & 2 & 3 \\ 2 & 3 & 5 \\ 3 & 4 & 7 \\ 4 & 5 & 9\end{array}\right]$.
(A) 1
(B) 2
(C) 3
(D) 4
10. Rolle's Theorem holds for the function $f(x)=x^{2}-6 x+8$ in the interval
$\qquad$ _.
(A) $[1,3]$
(B) $[2,4]$
(C) $[3,5]$
(D) $[2,6]$
11. If $x$ and $y$ are real numbers then $\max (x, y)+\min (x, y)$ equals to
(A) $2 y$
(B) $2 x$
(C) $\frac{x+y}{2}$
(D) $x+y$
12. If A and B are any two symmetric matrices of the same order, which of the following need not be a symmetric matrix?
(A) $\mathrm{A}+\mathrm{B}$
(B) $\mathrm{A}-\mathrm{B}$
(C) AB
(D) $A^{T}+B^{T}$, where $A^{T}$ denotes transpose of $A$.
13. When calculating the average growth of economy, the correct mean to use is?
(A) Weighted Mean
(B) Geometric Mean
(C) Harmonic Mean
(D) Arithmetic Mean
14. The quartile deviation includes the :
(A) First 50\%
(B) Last 50\%
(C) Central 50\%
(D) Last $75 \%$
15. Sum of absolute deviation about median is:
(A) The least
(B) The largest
(C) One
(D) Zero
16. If $X$ and $Y$ are independent standard normal random variables, then what is the variance of $\mathrm{X}-\mathrm{Y}$ ?
(A) 0
(B) 1
(C) 2
(D) $\sqrt{2}$
17. In a frequency curve of scores, the mode was found to be higher than the mean. This shows that the distribution is :
(A) Negatively skewed
(B) Positively skewed
(C) Poisson
(D) Normal
18. The standard deviation of marks of 100 students is 12 . Every student is later awarded 5 marks. The standard deviation of new set of marks is
(A) $12+\sqrt{5}$
(B) 17
(C) 12
(D) $\sqrt{17}$
19. Which of the following helps in identifying correlation between two variables?
(A) Box-plot
(B) Scatter plot
(C) Stem and leaf plot
(D) Textile plot
20. For a specific sample size, the width of a $95 \%$ confidence interval on $\mu$
(A) would be larger than the width of a $90 \%$ confidence interval on $\mu$
(B) would be smaller than the width of a $90 \%$ confidence interval on $\mu$
(C) would be the same as the width of a $90 \%$ confidence interval on $\mu$
(D) cannot be compared to the width of a $90 \%$ confidence interval on $\mu$
21. In the following sequence of two symbols $x$ and $y$,the number of runs exhibited is equal to : xyyyxxxyxyyy
(A) 7
(B) 8
(C) 5
(D) 6
22. If $X$ has $F(1,2)$ distribution, what is the distribution of $\frac{1}{X}$ ?
(A) $\mathrm{F}(1,2)$
(B) $\mathrm{F}(2,1)$
(C) $\operatorname{Normal}(1,2)$
(D) $\operatorname{Beta}(2,1)$
23. Which of the following is not true for a simple linear regression model?
(A) The response and regressor variables have to be measured in the same unit of measurement
(B) The response and regressor variables need not be measured in the same unit of measurement
(C) The error variance is assumed to be constant
(D) The model is a linear model
24. For which one of the following distributions, is it true that the sum of a finite number of independent and identically distributed random variables having that distribution has the same distribution as any one of them?
(A) Normal
(B) Uniform
(C) Exponential
(D) Binomial
25. Double sampling is also called
(A) Three stage sampling
(B) Stratified sampling
(C) Two Phase Sampling
(D) Systematic Sampling
26. The coefficient of correlation is independent of :
(A) Change of scale only
(B) Change of origin only
(C) Both Change of scale and origin
(D) Change at constant
27. The coefficient of correlation :
(A) has no limits
(B) Can be less than one
(C) Can be more than one
(D) varies between $\pm$ one
28. The further the two regression lines cut each other :
(A) Greater will be the degree of correlation
(B) The lesser will be the degree of correlation
(C) Does not matter
(D) Equal will be the degree of correlation
29. The number of questions in a questionnaire should be :
(A) As small as possible, keeping in view the purpose of inquiry
(B) As large as possible
(C) Between 40 and 80
(D) Infinite questions
30. A Teacher calculated the mean marks of 10 students as 83 . After wards, he increased the marks of one student by 10 . Then, what is the new mean marks?
(A) 84
(B) 84.5
(C) 85
(D) 83.5 .
31. For a symmetric distribution the lower and upper quartiles are 136 and 158 respectively. Then what is the Median?
(A) 147
(B) 140
(C) 150
(D) 146
32. If $X$ has normal distribution with mean 1 and variance 2 , what is the distribution of X-1?
(A) Normal with mean 0 and variance 3
(B) Normal with mean 0 and variance 2
(C) Normal with mean 1 and variance 2
(D) Normal with mean 1 and variance 3
33. Which of the following is a relative measure of dispersion?
(A) Variance
(B) Coefficient of variance
(C) Standard Deviation
(D) Range
34. A negative coefficient of skewness implies that:
(A) Mean is less than Mode
(B) Mean is greater than Mode
(C) Mean is equal to Mode
(D) Median is equal to Mode
35. Which of the following is true for the unbiased estimator $t$ of the parameter $\theta$.
(A) Bias of the estimator is positive
(B) Bias of the estimator is negative
(C) Mean square error $(\mathrm{t})=$ Variance $(\mathrm{t})$
(D) Large MSE
36. The calculated value of Chi-square is :
(A) Always negative
(B) Neither positive nor negative
(C) Always positive
(D) Either positive or negative
37. In testing of a null hypothesis that an accused is innocent, the type-I error is?
(A) Decide to punish him when he is innocent
(B) Decide to acquit him when he is guilty
(C) Decide to punish him when he is guilty
(D) Decide to acquit him when he is innocent
38. The probability of a defective bolt is 0.2 . Then the mean for the distribution of defective bolts in a total of 1,000 is :
(A) 1000
(B) 360
(C) 200
(D) 126
39. For the given numbers: $2,6,1,5,3,7,2$, what is the moving average of order 3 ?
(A) $3,4,3,5,4$
(B) $3,4,5,3,4$
(C) 3,4,3,4,5
(D) $3,5,3,4,4$
40. In how many ways can 3 girls and 5 boys be arranged in a row so that all the 3 girls are together?
(A) 4320 ways
(B) 500 ways
(C) 234 ways
(D) 1050 ways
41. The most important factors causing seasonal variations are :
(A) Growth of population
(B) Depression in business
(C) Weather and social customs
(D) Stock exchange
42. In time series analysis both trends and seasonal variations are studied because they:
(A) Describe past patterns
(B) Allow the elimination of the component from the series
(C) Allow projections to the future
(D) Foretell the future
43. Commodities which show considerable price fluctuations could be best measured by a :
(A) Price Index
(B) Value Index
(C) Paasche's Index
(D) Quantity Index
44. The aggregate price index that uses base year quantities as base is :
(A) Paasche's Index
(B) Fishers's Index
(C) Laspeyre's Index
(D) Quantity Index
45. Which of the following is useful in studying poverty levels?
(A) Gini Index
(B) Fish-bone diagram
(C) Simplex method
(D) Lagrange's multipliers
46. Yates' algorithm is used to compute one of the following. Which one?
(A) Factorial effect totals
(B) Variance of factorial effects
(C) Mean of factorial effects
(D) Standard errors of factorial effects
47. Which of the following is not a basis for design of experiments?
(A) Randomization
(B) Minimization
(C) Local control
(D) Replication
48. Which of the following is the sampling distribution of the likelihood ratio test statistic for mean of a normal distribution when the sample size is large?
(A) Normal
(B) Chi-square
(C) F
(D) T
49. If $\left\{X_{n}, n \geq 1\right\}$ is a sequence of independent standard normal random variables, what is the distribution of $X_{1}^{2}+\ldots+X_{10}^{2}$ ?
(A) Chi-square distribution with 10 degrees of freedom
(B) Standard normal distribution
(C) Chi-square distribution with 100 degrees of freedom
(D) Normal distribution with mean 10 and variance 100
50. A Sampling frame is
(A) a summary of the various stages involved in designing a survey
(B) an outline view of all the main units in a sample
(C) a list of all the units in the population from which a sample will be selected
(D) a frame used to display tables of random numbers
51. Which of the following is an example of a two-way ANOVA model?
(A) RBD
(B) CRD
(C) LSD
(D) Yate's model
52. Infant mortality rate (IMR) is defined as :
(A) number of deaths of children less than one year of age per 1000 live births
(B) number of deaths of children less than five years of age per 1000 live births
(C) neither (A) nor (B)
(D) number of deaths of children less than three years of age per 1000 live births
53. Which of the following is measure of death rates of babies?
(A) Mortality rate
(B) Infant Mortality Rate
(C) Age specific death rate
(D) standardized death rates
54. In a factorial experiment with two factors, each considered at three levels, what is the total number of treatment combinations?
(A) 9
(B) 8
(C) 6
(D) 5
55. Which of the following statement is false?
(A) A Lorenz curve always starts at $(0,1)$ and ends at $(1,0)$
(B) The Lorenz curve is not defined if the mean of the probability distribution is zero or infinite
(C) The Lorenz curve cannot rise above the line of perfect equality
(D) The information in a Lorenz curve may be summarized by the Gini coefficient

## (i) (1) (i)

## Rough Work

## అభ్యథిรగษిగి శ్జอఒసేగఆు



 ఎంబదన్ను யరిరిలలిసిరి.



 జదాబ్దారరంగిరుత్తిర.


 లుత్తరహస్ను నిధణరిి.


 కుంబిర:




 ळలళెయల్లిన లుదాळరణ నైలణి.
 యృడ్బొలు.
 పిల్టలిద్యానిలయుద
 ஹృఁగబळుదు.




 అంచగఆన్ను யֹడియత్ర్ప్దు.

## ఓ.ఎం.ఆరా. ळలఆయన్ను కుంబలు ష్యృజసెగళు









Note : English version of the instructions is printed on the front cover of this booklet.

