



UNIVERSITY OF MYSORE

Postgraduate Entrance Examination June/July 2017

SUBJECT CODE :

6 5

QUESTION BOOKLET NO.

122797

Entrance Reg. No.

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QUESTION BOOKLET

(Read carefully the instructions given in the Question Booklet)

COURSE :

M.Sc.

SUBJECT :

Statistics

MAXIMUM MARKS : 50

MAXIMUM TIME : ONE HOUR

(Including initial 10 minutes for filling O.M.R. Answer sheet)

INSTRUCTIONS TO THE CANDIDATES

1. The sealed questions 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 of alphabet and signs as instructed, you will be personally responsible for consequences arising during scoring of 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 Sl. No.8 of O.M.R. Answer Sheet using Blue/Black Ball Point Pen as follows:

Question No. 8. (A) (B) (C) (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.**

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 stray marks on O.M.R. Sheet.

ಗಮನಿಸಿ : ಸೂಚನೆಗಳ ಕನ್ನಡ ಆವೃತ್ತಿಯು ಈ ಪುಸ್ತಕದ ಹಿಂಭಾಗದಲ್ಲಿ ಮುದ್ರಿಸಲ್ಪಟ್ಟಿದೆ.

1) If $f(x) = \cos(x)$ and $g(x) = x^3$, then $(f \circ g)(x)$ is

(A) $(\cos(x))^3$

(B) $\cos^3(x)$

(C) $\cos(x^3)$

(D) x^{\cos^3}

2) The value of determinant $\begin{vmatrix} 0 & c & b \\ -c & 0 & a \\ -b & -a & 0 \end{vmatrix}$

(A) $-bac$

(B) bac

(C) 0

(D) $a+bca$

3) If x and y are real numbers then $\max(x,y) + \min(x,y)$ equals to

(A) $2y$

(B) $2x$

(C) $\frac{x+y}{2}$

(D) $x+y$

4) Which of the following statements is correct?

(A) A continuous function is always differentiable

(B) A differentiable function is always continuous

(C) A differentiable function need not be continuous

(D) Continuity and differentiability are unrelated concepts

5) If the columns of the matrix $A_{4 \times 3}$ are linearly independent, then the rank of $A_{4 \times 3}$ is

(A) < 3

(B) > 3

(C) 4

(D) 3

- 6) The inverse of a non-singular matrix is equal to which one of the following?
- (A) Adjoint of the matrix
 (B) Adjoint of the matrix divided by its determinant
 (C) Cofactor of the matrix
 (D) Transpose of the adjoint of the matrix divided by its determinant
- 7) If $|A_{3 \times 3}| = 10$ then $|2A_{3 \times 3}|$ is
- (A) 20
 (B) 40
 (C) 60
 (D) 80
- 8) The sum: half + half squared + half cubed + ... is equal to which one of these?
- (A) $\frac{1}{2}$
 (B) 0
 (C) 1
 (D) 2
- 9) Which one of the following statements is appropriate for the sum: one + half + one third + one fourth + ...
- (A) Converges to 2
 (B) Diverges to infinity
 (C) Is bounded above
 (D) Converges to 3
- 10) Which one of the following statements is correct for the sum of x to the power of n divided by factorial n from n equal to 0 to infinity?
- (A) Diverges for all real x
 (B) Converges to e to the power of x , for all x
 (C) Converges only for some x
 (D) Converges for some x and diverges for the remaining
- 11) 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) $\sqrt{17}$

- 12) The numbers whose arithmetic mean is 12.5 and geometric is 10 are
- (A) 10, 15
(B) 20, 5
(C) 4, 21
(D) 13, 12

13) Variance of first n natural numbers is

- (A) $\frac{n^2 - 1}{12}$
(B) $\left(\frac{n+1}{2}\right)^2$
(C) $\frac{n(n+1)(2n+1)}{6}$
(D) $\frac{(n+1)(2n+1)}{6}$

14) The empirical relation among averages is

- (A) Mean - Mode = 2 (Mean — Median)
(B) Mean - Mode = 4 (Mean -- Median)
(C) Mean - Mode = 3 (Mean — Median)
(D) Mean - Mode = Median

15) The regression coefficient of Y on X is 0.15 and that of X on Y is 0.6. Then the correlation coefficient between X and Y is

- (A) $\sqrt{0.009}$
(B) 0.09
(C) 0.25
(D) 0.3

16) For the following data

X: -3 -2 -1 0 1 2 3

Y: 9 4 1 0 1 4 9

the correlation coefficient is

- (A) 0
(B) 1
(C) -1
(D) 0.5

- 17) If the covariance between two random variables is positive, then the correlation coefficient will be between
- (A) (-1,0) (B) (0, 1)
 (C) (-0.5, 0.5) (D) (-0.5, 1)
- 18) The correlation coefficient ρ of 20 observations of the variables X and Y is 0.3. Then correlation coefficient between $2+7X$ and $3+2Y$ is
- (A) 0.54 (B) 0.40
 (C) 0.64 (D) 0.30
- 19) For the marks of 8 students in Statistics and Mathematics, the sum of squares of differences of ranks of these marks is 14. Then what is the value of spearman's rank correlation coefficient.
- (A) 0.56 (B) 0.75
 (C) -0.5 (D) 0.833
- 20) If A and B are two independent events, which one of the following is not true?
- (A) $P(AB) = P(A)P(B)$ (B) $P(A^c B^c) = P(A^c)P(B^c)$
 (C) $P(A^c B) = P(A^c)P(B)$ (D) $P(A \cup B) = P(A) + P(B)$
- 21) If an event A occurs whenever event B occurs then it is true that
- (A) $P(A^c) \leq P(B^c)$ (B) $P(A^c) \geq P(B^c)$
 (C) $P(A^c) = P(B)$ (D) $P(A) = P(B)$
- 22) The mgf of a r.v x is $\exp(t^2)$. Then the distribution of X is
- (A) Exponential (B) Gamma
 (C) $N(0, \sqrt{2})$ (D) $N(0, \sqrt{4})$
- 23) A random variable has mean 3 and variance 2. Then the upper bound for $P(|X - 3| \geq 2)$ is
- (A) 1 (B) $\frac{3}{4}$
 (C) $\frac{1}{4}$ (D) $\frac{1}{2}$

(P.T.O.)

24) In which of these cases, the Poisson distribution would be a good approximation of the binomial distribution $b(x; n, p)$?

(A) $n=200, q=0.98$

(B) $n=45, p=0.35$

(C) $n=50, q=0.59$

(D) $n=10, p=0.05$

25) Let (X, Y) have joint pdf given by $f(x, y) = e^{-(x+y)}, x, y > 0$. Then

(A) X and Y are independent

(B) X and Y are not independent

(C) Correlation coefficient between X and Y is 1

(D) None of the above

26) For the following probability distribution of X

$X:$ 0 1 2 3

$p(x):$ $\frac{1}{6}$ $\frac{1}{2}$ $\frac{3}{10}$ $\frac{1}{30}$. Then $P(0 < X < 2)$ equal to

(A) $\frac{29}{30}$

(B) $\frac{1}{2}$

(C) $\frac{4}{5}$

(D) $\frac{2}{3}$

27) Let X be uniformly distributed random variable over $[1, 3]$, then the value of x_0

such that $P[X < 2 + x_0] = \frac{3}{4}$ is

(A) $\frac{1}{4}$

(B) $\frac{1}{2}$

(C) $\frac{1}{8}$

(D) $\frac{3}{4}$

28) If X follows binomial distribution with parameter n and p , then variance of X/n is

(A) $\frac{p(1-p)}{n}$

(B) $\frac{p(1-p)}{n^2}$

(C) $p(1-p)$

(D) $np(1-p)$

29) Which of the following represent a simple hypothesis in a normal population with mean μ and variance σ^2 , using the codes given below?

1) $\mu = 2$ 2) $\sigma^2 = 1$ 3) $\mu = \sigma^2$

(A) 1 and 2 are correct

(B) 2 and 3 are correct

(C) 1, 2 and 3 are correct

(D) None of these are correct

30) Assuming the normal distribution, suppose that a 95% confidence interval for mean μ is (50, 60). Which of the following could possibly be a 99% confidence interval?

(A) (52, 58)

(B) (52, 62)

(C) (48, 62)

(D) (48, 58)

31) Which of the following is not a correct decision in testing of hypothesis

(A) Rejecting H_0 when H_0 is false

(B) Fail to reject H_0 when H_0 is true

(C) Rejecting H_1 when H_1 is false

(D) Rejecting H_0 when H_1 is false

32) Based on n iid observations X_1, X_2, \dots, X_n from $N(\mu, \sigma^2)$ the MLE of σ^2 is

(A) is unbiased and sufficient for σ^2

(B) is unbiased and Consistent estimator for σ^2

(C) is unbiased but not sufficient for σ^2

(D) is consistent estimator and sufficient for σ^2

33) A statistic t based on a sample of n observations is said to be unbiased for population parameter θ if

(A) $E(t) \neq \theta$

(B) $E(t) - \theta = 0$

(C) $E(\theta) - t = 0$

(D) $E(t) = 0$

34) Identify the odd item in the following

(A) Local control

(B) Randomization

(C) Replication

(D) Confounding

- 35) If the degrees of freedom for error SS is in a LSD is 30, then the order of the design is
- (A) 5X5 (B) 6X6
(C) 7X7 (D) 8X8
- 36) In an RBD with 4 treatments and 5 blocks, the sum of squares due to treatments is 310, sum of squares due to blocks is 184 and sum of squares due to error is 24. Then F-ratio due to treatments is
- (A) 24.8 (B) 51.7
(C) 25.5 (D) 1
- 37) Analysis of variance is a technique to test the hypothesis of the equality of several (assuming normality)
- (A) variances (B) standard deviations
(C) replications (D) means of populations
- 38) Proportional, Neyman and Optimum allocations refer to allocation of which one of these?
- (A) Sample size (B) Sample variance
(C) Sample standard error (D) Sampling costs
- 39) The findings from a study of young single mothers at a university can be generalized to the population of:
- (A) All young single mothers at that university
(B) All young single mothers at that society
(C) All young single mothers in all universities
(D) All young women in that university
- 40) If from a finite population of size 200, a random sample of size 50 is selected, then the finite population correction factor will be
- (A) 0.75 (B) 10
(C) 0.10 (D) 0.87

- 41) With reference to SRS and stratified RS, which one of the following statements is true?
- (A) SRS is more efficient than stratified RS
 - (B) SRSWOR is more efficient than stratified RS
 - (C) SRSWR and stratified RS are equally efficient
 - (D) Stratified RS is more efficient than SRS
- 42) In systematic sampling, the following is selected at random
- (A) All units
 - (B) Half of the units
 - (C) Last unit only
 - (D) First unit only
- 43) The total fertility rate (TFR) is
- (A) the total number of children born in a country in a given year divided by labor force
 - (B) the number of children born to the average woman during her reproductive years
 - (C) the number of births in a country divided by total population in a given year
 - (D) the number of women age 15-45 in a country divided by total population
- 44) Vital statistics is mainly concerned with
- (A) Births
 - (B) deaths
 - (C) marriages
 - (D) all of these
- 45) The Physical Quality of Life Index (PQLI) combines three indicators. They are
- (A) Infant mortality, life expectancy and adult literacy rate
 - (B) Crime rate, clean environment and quality of housing
 - (C) Air pollution rate, water pollution rate and sanitation
 - (D) Health, education and environment

- 46) Salient factors responsible for seasonal variations are:
- (A) Weather
 - (B) Social customs
 - (C) Festivals
 - (D) All the above
- 47) 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
- 48) Fisher's ideal index numbers are associated with one of these:
- (A) prices of commodities
 - (B) quantities of commodities
 - (C) prices and quality of commodities
 - (D) prices and quantities of commodities
- 49) In Marshall-Edgeworth index number the weight used is
- (A) $\frac{q_0 + q_1}{2}$
 - (B) $q_0 * q_1$
 - (C) $p_0 * q_0$
 - (D) $p_1 * q_1$
- 50) Given the numbers 2,6,1,5,3,7,2 a moving average of order 3 is the sequence
- (A) (3,4,3,5,4)
 - (B) (3,4,5,4,3)
 - (C) (3,5,4,3,3)
 - (D) (3,4,3,4,5)

EEE

ROUGH WORK

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

1. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯ ಜೊತೆಗೆ 50 ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿರುವ ಮೊಹರು ಮಾಡಿದ ಪ್ರಶ್ನೆ ಪುಸ್ತಕವನ್ನು ನಿಮಗೆ ನೀಡಲಾಗಿದೆ.
2. ಕೊಟ್ಟಿರುವ ಪ್ರಶ್ನೆ ಪುಸ್ತಕವು, ನೀವು ಪರೀಕ್ಷೆಗೆ ಆಯ್ಕೆ ಮಾಡಿಕೊಂಡಿರುವ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ್ದೇ ಎಂಬುದನ್ನು ಪರಿಶೀಲಿಸಿರಿ.
3. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಮೊಹರನ್ನು ಜಾಗ್ರತೆಯಿಂದ ತೆರೆಯಿರಿ ಮತ್ತು ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯಿಂದ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯನ್ನು ಹೊರಗೆ ತೆಗೆದು, ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಸಾಮಾನ್ಯ ಮಾಹಿತಿಯನ್ನು ತುಂಬಿರಿ. ಕೊಟ್ಟಿರುವ ಸೂಚನೆಯಂತೆ ನೀವು ನಮೂನೆಯಲ್ಲಿನ ವಿವರಗಳನ್ನು ತುಂಬಲು ವಿಫಲರಾದರೆ, ನಿಮ್ಮ ಉತ್ತರ ಹಾಳೆಯ ಮೌಲ್ಯಮಾಪನ ಸಮಯದಲ್ಲಿ ಉಂಟಾಗುವ ಪರಿಣಾಮಗಳಿಗೆ ವೈಯಕ್ತಿಕವಾಗಿ ನೀವೇ ಜವಾಬ್ದಾರಾಗಿರುತ್ತೀರಿ.
4. ಪರೀಕ್ಷೆಯ ಸಮಯದಲ್ಲಿ:
 - a) ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಯನ್ನು ಜಾಗ್ರತೆಯಿಂದ ಓದಿರಿ.
 - b) ಪ್ರತಿ ಪ್ರಶ್ನೆಯ ಕೆಳಗೆ ನೀಡಿರುವ ನಾಲ್ಕು ಲಭ್ಯ ಆಯ್ಕೆಗಳಲ್ಲಿ ಅತ್ಯಂತ ಸರಿಯಾದ/ ಸೂಕ್ತವಾದ ಉತ್ತರವನ್ನು ನಿರ್ಧರಿಸಿ.
 - c) ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿನ ಸಂಬಂಧಿಸಿದ ಪ್ರಶ್ನೆಯ ವೃತ್ತಾಕಾರವನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬಿರಿ. ಉದಾಹರಣೆಗೆ, ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಪ್ರಶ್ನೆ ಸಂಖ್ಯೆ 8ಕ್ಕೆ "C" ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದರೆ, ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಬಳಸಿ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯ ಕ್ರಮ ಸಂಖ್ಯೆ 8ರ ಮುಂದೆ ಈ ಕೆಳಗಿನಂತೆ ತುಂಬಿರಿ:
 ಪ್ರಶ್ನೆ ಸಂಖ್ಯೆ 8.(A) (B) (C) (D) (ಉದಾಹರಣೆ ಮಾತ್ರ) (ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರ ಉಪಯೋಗಿಸಿ)
5. ಉತ್ತರದ ಪೂರ್ವಸಿದ್ಧತೆಯ ಬರವಣಿಗೆಯನ್ನು (ಚಿತ್ತು ಕೆಲಸ) ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಒದಗಿಸಿದ ಖಾಲಿ ಜಾಗದಲ್ಲಿ ಮಾತ್ರವೇ ಮಾಡಬೇಕು (ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಮಾಡಬಾರದು).
6. ಒಂದು ನಿರ್ದಿಷ್ಟ ಪ್ರಶ್ನೆಗೆ ಒಂದಕ್ಕಿಂತ ಹೆಚ್ಚು ವೃತ್ತಾಕಾರವನ್ನು ಗುರುತಿಸಲಾಗಿದ್ದರೆ, ಅಂತಹ ಉತ್ತರವನ್ನು ತಪ್ಪು ಎಂದು ಪರಿಗಣಿಸಲಾಗುತ್ತದೆ ಮತ್ತು ಯಾವುದೇ ಅಂಕವನ್ನು ನೀಡಲಾಗುವುದಿಲ್ಲ. ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿನ ಉದಾಹರಣೆ ನೋಡಿ.
7. ಅಭ್ಯರ್ಥಿ ಮತ್ತು ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರು ನಿರ್ದಿಷ್ಟಪಡಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯ ಮೇಲೆ ಸಹಿ ಮಾಡಬೇಕು.
8. ಅಭ್ಯರ್ಥಿಯು ಪರೀಕ್ಷೆಯ ನಂತರ ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ಮೂಲ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆ ಮತ್ತು ವಿಶ್ವವಿದ್ಯಾನಿಲಯದ ಪ್ರತಿಯನ್ನು ಹಿಂದಿರುಗಿಸಬೇಕು.
9. ಅಭ್ಯರ್ಥಿಯು ಪ್ರಶ್ನೆ ಪುಸ್ತಕವನ್ನು ಮತ್ತು ಓ.ಎಂ.ಆರ್. ಅಭ್ಯರ್ಥಿಯ ಪ್ರತಿಯನ್ನು ತಮ್ಮ ಜೊತೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
10. ಕ್ಯಾಲ್ಕುಲೇಟರ್, ಪೇಜರ್ ಮತ್ತು ಮೊಬೈಲ್ ಫೋನ್‌ಗಳನ್ನು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಒಳಗೆ ಅನುಮತಿಸಲಾಗುವುದಿಲ್ಲ.
11. ಅಭ್ಯರ್ಥಿಯು ದುಷ್ಕೃತ್ಯದಲ್ಲಿ ತೊಡಗಿರುವುದು ಕಂಡುಬಂದರೆ, ಅಂತಹ ಅಭ್ಯರ್ಥಿಯನ್ನು ಕೋರ್ಸ್‌ಗೆ ಪರಿಗಣಿಸಲಾಗುವುದಿಲ್ಲ ಮತ್ತು ನಿಯಮಗಳ ಪ್ರಕಾರ ಇಂತಹ ಅಭ್ಯರ್ಥಿಯ ವಿರುದ್ಧ ಕ್ರಮ ಕೈಗೊಳ್ಳಲಾಗುವುದು.
 ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯನ್ನು ತುಂಬಲು ಸೂಚನೆಗಳು
 1. ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೆ ಒಂದೇ ಒಂದು ಅತ್ಯಂತ ಸೂಕ್ತವಾದ/ಸರಿಯಾದ ಉತ್ತರವಿರುತ್ತದೆ.
 2. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಒಂದು ವೃತ್ತವನ್ನು ಮಾತ್ರ ನೀಲಿ ಅಥವಾ ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್‌ನಿಂದ ಮಾತ್ರ ತುಂಬತಕ್ಕದ್ದು. ಉತ್ತರವನ್ನು ಮಾರ್ಪಡಿಸಲು ಪ್ರಯತ್ನಿಸಬೇಡಿ.
 3. ವೃತ್ತದೊಳಗಿರುವ ಅಕ್ಷರವು ಕಾಣದಿರುವಂತೆ ವೃತ್ತವನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬುವುದು.
 4. ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿ ಯಾವುದೇ ಅನಾವಶ್ಯಕ ಗುರುತುಗಳನ್ನು ಮಾಡಬೇಡಿ.

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

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