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(To be filled in the OMR Sheet)

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

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प्रश्नपुस्तिका सीरीज
Question Booklet Series
**C**

# M.Sc Industrial Chemistry (First Semester) Examination, February/March-2022
# MSIC-102
# Research Methodology, Statistical Techniques and Computer Applications

**Time : 1:30 Hours** **Maximum Marks-100**

**जब तक कहा न जाय, इस प्रश्नपुस्तिका को न खोलें**

**निर्देश : –**

1. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सीरीज का विवरण यथास्थान सही– सही भरें, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
2. **इस प्रश्नपुस्तिका में 100 प्रश्न हैं, जिनमे से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने है। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर पत्रक (O.M.R. ANSWER SHEET)में उसके अक्षर वाले वृत्त को काले या नीले बाल प्वांइट पेन से पूरा भर दें। यदि किसी परीक्षार्थी द्वारा निर्धारित प्रश्नों से अधिक प्रश्नों के उत्तर दिये जाते हैं तो उसके द्वारा हल किये गये प्रथमतः यथा निर्दिष्ट प्रश्नोत्तरों का ही मूल्यांकन किया जायेगा।**
3. प्रत्येक प्रश्न के अंक समान हैं। आप के जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
4. सभी उत्तर केवल ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर ही दिये जाने हैं। उत्तर पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
5. ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाय।
6. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी प्रश्नपुस्तिका बुकलेट एवं ओ०एम०आर० शीट पृथक–पृथक उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
7. निगेटिव मार्किंग नहीं है।

**महत्वपूर्ण : –** **प्रश्नपुस्तिका खोलने पर प्रथमतः जॉच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभॉति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।**

**416**

1. Flow chart is a type of diagram that represent a/an :

   (A) Algorithm

   (B) Work Flow

   (C) Process

   (D) All

2. Computer helps us in :

   (A) Tabulating data

   (B) Understanding data

   (C) Both

   (D) None

3. Translation of user program into binary format is done by which device :

   (A) Input

   (B) Output

   (C) Hardware

   (D) Software

4. Each individual web page or image has a :

   (A) Same value of URL

   (B) Distinct value of URL

   (C) Cannot be said correctly

   (D) None

5. Rich text file can be saved in :

   (A) (.doc) only

   (B) (.rtf) only

   (C) Both

   (D) None

6. (.XML) is a :

(A) Binary format

(B) Mark-up-file

(C) Hybrid format of both

(D) None

7. Rich text files can be saved in :

(A) Binary format

(B) Mark-up-file

(C) Both

(D) None

8. Rich text files contains characters such as :

(A) Font size

(B) Alignment

(C) Page specification

(D) All

9. Which one is not a web browser :

(A) Mozilla Firefox

(B) Google

(C) Chrome

(D) None

10. Central Processing Unit of computer can be divided into :

(A) Two parts

(B) Three parts

(C) Four parts

(D) None

11. Which of the following is used for the startup of computer :

(A) ROM

(B) RAM

(C) Both

(D) None

12. Which one is volatile in nature :

(A) ROM

(B) RAM

(C) Both

(D) None

13. Find decimal value of 101 from the following :

(A) 101

(B) 15

(C) 5

(D) 20

14. 'www' stands for :

(A) World with web

(B) World without web

(C) World Witholding web

(D) World wide web

15. Which one is not an input device :

(A) Barcode reader

(B) Plotter

(C) Both

(D) None

16. Primary storage devices are :

(A) Temporary data storing

(B) Permanent data storing

(C) Semi permanent data storing

(D) All

17. Which one is more faster :

(A) RAM

(B) ROM

(C) Both are same

(D) None

18. RAM stands for

(A) Read all Memory

(B) Random all Memory

(C) Random Access Memory

(D) None

19. A chip may be of how many Bits :

(A) 2, 4, 6, 8 Bits

(B) 8, 16, 32, 64 Bits

(C) 1, 3, 5, 7, 9 Bits

(D) All

20. Which of the following is correct :

(A) 1 Byte = 1 Bit

(B) 1 Byte = 6 Bit

(C) 1 Byte = 8 Bit

(D) 1 Byte = 2 Bit

21. The Transistors on an integrated circuits have two states :

(A) ON and OFF

(B) ON and Shut down

(C) ON and Stand by

(D) None

22. Memory chips of computer are :

(A) Isolated circuits

(B) Inserted circuits

(C) Integrated circuits

(D) None

23. Integrated circuit is an electronic circuit fabricated on single chip of :

(A) Carbon

(B) Sodium

(C) Silicon

(D) All

24. In computer, Hardware refers to :

(A) All hard components

(B) All physical components of computer

(C) Storage devices only

(D) None

25. In correlation two variables may be :

(A) Increasing

(B) Decreasing

(C) May not be related

(D) All

26. Correlation may be :

(A) Positive only

(B) Negative only

(C) Both

(D) None

27. Which of the following relation shows one way ANOVA short cut method :

(A) $n_T = \frac{CF}{T^2}$

(B) $T^2 = \frac{CF}{n_T}$

(C) $CF = \frac{n_t}{T^2}$

(D) $CF = \frac{T^2}{n_T}$

28. If 'T' denotes Sum of all observations and 'CF' denotes correction factor and '$n_T$' denotes total number of observations then which of the following relation is correct:

(A) $n_T = \frac{CF}{T^2}$

(B) $T^2 = \frac{CF}{n_T}$

(C) $CF = \frac{n_t}{T^2}$

(D) $CF = \frac{T^2}{n_T}$

29. Which one is the assumption of ANOVA application :

(A) All samples are taken randomly

(B) Variance of different population is similar

(C) Samples are independent

(D) All

30. Formula for F-value is given below. Which one is incorrect :

(A) F-value $= \frac{variance\ between\ samples}{variance\ within\ samples}$

(B) F-value $= \frac{variance\ within\ samples}{variance\ between\ samples}$

(C) Both

(D) None

31. Test of independence of attributes determines that whether two attributes are :

(A) Linked

(B) Not linked

(C) Both

(D) None

32. Higher coefficient of variance denotes higher data :

(A) Similarity

(B) Dispersion

(C) 50% Similarity and 50% Dispersion

(D) None

33. "Coefficience of variance is defined as % of variation of mean in terms of standard deviation." the above sentence is true for :

(A) Special condition

(B) All the condition

(C) Most of the condition

(D) All

34. Which of the following is the best representation of calculation of coefficient of variance to find out dispersion of data :

(A) Coefficient of variance $= \frac{Mean}{Standard\ variation} \times 100$

(B) Coefficient of variance $= \frac{Standard\ variation}{Mean} \times 100$

(C) Coefficient of variance $= \frac{variance}{Mean} \times 100$

(D) None

35. Mean of sampling distribution of means is always equal to the population mean is based on the following :

(A) Sample size

(B) Sample shape

(C) Both

(D) None

36. Standard error is defined as the standard deviation of sampling distribution of :

(A) Means

(B) Medians

(C) Modes

(D) Variances

37. In positively Skewed data, there are extreme values on :

(A) Right hand side

(B) Left hand side

(C) Middle

(D) None

38. In negatively Skewed data, there are extreme values on :

(A) Right hand side

(B) Left hand side

(C) Middle

(D) None

39. A pointed peak of data distribution indicates a very :

(A) Elaborated data with Maximum frequency

(B) Elaborated data with Minimum frequency

(C) Little data with Maximum frequency

(D) Little data with little frequency

40. If the Peak is normal, it is called :

(A) Mesokritic

(B) Mesokurtic

(C) Mesopetic

(D) Mesosetic

41. In question 59, the Flat Peak is called :

(A) Patykurtic

(B) Mesokurtic

(C) Platykurtic

(D) None

42. In distribution of data a flat peak depicts majority of data :

(A) Similar to central tendency

(B) Dissimilar to central tendency

(C) Cannot be accurately calculated

(D) None

43. "In statistical analysis it is assumed that normal distribution of data is present." Above sentence is :

(A) False

(B) True

(C) Depends on type of data

(D) None

44. Leptokurtic Peak tells about a pointed peak with very little data and …….. frequency.

(A) Constant

(B) Minimum

(C) Moderate

(D) Maximum

45. The Peakness of data indicate the proportion of data :

(A) Variant to central tendency

(B) Similar to central tendency

(C) Variant to dispersion

(D) Similar to dispersion

46. Skewed data means that there are few extreme values on :

(A) Either side of data

(B) Neither side of data

(C) One one side only

(D) None

47. In question 53, the standard deviation is :

(A) 5.438

(B) 15.438

(C) 18.412

(D) 29.57

48. Earning per share for an industry are as follow (in Rs.)

5, 7, 7, 8, 9, 12, 15, 18, 22

Find out variance of this data.

(A) 39.57

(B) 29.57

(C) 49.57

(D) 19.57

49. If $\sigma$ is standard deviation then which is correct :

(A) $\sigma = \frac{\Sigma x_i^2}{N} - (\overline{X})^2$

(B) $\sigma^2 = \frac{\Sigma x_i^2}{N} - (\overline{X})^2$

(C) $\sigma = \frac{\Sigma x_i}{N} - (\overline{X})^2$

(D) None

50. If $\sigma$ is variance and SD is standard deviation then :

(A) $SD = \sigma^2$

(B) $\sigma = SD^2$

(C) $SD = \sigma$

(D) $\sigma = \sqrt{SD}$

51. "Variance is equal to square of standard deviation." Above sentence is :

(A) Always True

(B) Some time True

(C) Always False

(D) Some time False

52. Empirical relationship between Mean, median & mode is :

(A) 3 Median = 3 mode + 3 mean

(B) 3 Median = mode + mean

(C) 3 Median = 2 mode + mean

(D) 3 Median = mode + 2 mean

53. If 'N' is the number of even measurement then Median is :

(A) $N^{th}$ item

(B) $\frac{N^{th}}{2}$ item

(C) $\left(\frac{N+1}{2}\right)^{th}$ item

(D) None

54. If 'N' is the number of odd measurement then Median is :

(A) $N^{th}$ item

(B) $\frac{N^{th}}{2}$ item

(C) $\left(\frac{N+1}{2}\right)^{th}$ item

(D) None of all

55. In question 45, the Mean has value :

(A) 42

(B) 52

(C) 62

(D) 72

56. Calculate Mode from following data :

| Marks | Number of students |
|---|---|
| 10-25 | 2 |
| 25-40 | 3 |
| 40-55 | 7 |
| 55-70 | 6 |
| 70-85 | 6 |
| 85-100 | 6 |

Mode is :

(A) 42

(B) 52

(C) 72

(D) 62

57. Formula for Mode is, Mode $= l + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$. In above formula 'h' stand for :

(A) Lower Limit

(B) Upper Limit

(C) Class Hieght

(D) Frequency of modal class

58. Calculate Mode of following observations :

0, 0, 1, 1, 2, 4, 4, 4, 5, 5, 7, 7, 8, 9, 10, 12, 12, 12, 12, 15

(A) 0

(B) 4

(C) 10.5

(D) 12

59. Measurement with maximum frequency is called as :

(A) Mean

(B) Median

(C) Mode

(D) Variance

60. Mode is defined as :

(A) Most frequency occurring observation

(B) Average frequency occurring observation

(C) Least frequency occurring observation

(D) None of above

61. In question 38, if assume mean is taken 80, then deviation in answer from the actual value is by :

(A) 10

(B) 0

(C) 39.71

(D) None

62. In question 38, if average is calculated by step deviation method then average percentage of female teachers is :

(A) 20

(B) 39.71

(C) 29.71

(D) 30

63. Find out average percentage of female teachers in a state from following data :

| % of Female teacher | $x_i$ | $f_i$ |
|---|---|---|
| 15-25 | 20 | 6 |
| 25-35 | 30 | 11 |
| 35-45 | 40 | 7 |
| 45-55 | 50 | 4 |
| 55-65 | 60 | 4 |
| 65-75 | 70 | 2 |
| 75-85 | 80 | 1 |

(A) 20

(B) 39.71

(C) 29.71

(D) 30

64. Formula for calculating Arethamatic mean by step deviation mean method is :

(A) $\bar{x} = a + \frac{h\sum_i x_i^2 f_i}{\sum_i f_i}$

(B) $\bar{x} = a + \frac{h\sum_i x_i {f_i}^2}{\Sigma_i f_i}$

(C) $\bar{x} = a + \frac{h\Sigma_i x_i f_i}{\sum_i f_i}$

(D) None

65. Arethamatic mean is calculated by using Assumed mean method and step deviation method: it was found that answer in both the cases was :

(A) Same

(B) Dissimilar

(C) Opposite

(D) None

66. Arethamatic mean for classified data is calculated using following formula :

(A) $\bar{x} = \frac{\Sigma d_i^2 f_i^2}{\Sigma f_i^2}$

(B) $\bar{x} = \frac{\Sigma d_i f_i^2}{\Sigma f_i^2}$

(C) $\bar{x} = \frac{\Sigma d_i^2 f_i}{\Sigma f_i}$

(D) $\bar{x} = \frac{\Sigma d_i f_i}{\Sigma f_i}$

67. In Question 33 which formula is applicable :

(A) Arethamatic Mean $= \frac{\Sigma f_i x_i^2}{\Sigma f_i x_i}$

(B) Arethamatic Mean $= \frac{\Sigma x_i}{\Sigma f_i}$

(C) Arethamatic Mean $= \frac{\Sigma f_i x_i}{\Sigma f_i}$

(D) None

68. Find Arethamatic mean of following data :

21, 21, 21, 11, 12, 14, 16, 12, 17, 16, 16, 18

(A) 20

(B) 25

(C) 15.42

(D) 16.25

69. Contigency table and side by side Bar chart are depicting form of which of the following :

(A) Univariant data

(B) Bivariant data

(C) Multivariant data

(D) None

70. Univariant data can be depicted by following :

(A) Bar chart

(B) Pie chart

(C) Horizontal

(D) All

71. Coding helps in looking _____ data in a compact form :

(A) Small

(B) Large

(C) Coding

(D) All

72. Data coding is :

(A) Easier method

(B) Lengthy method

(C) Not confirmed

(D) None

73. Cluster Sampling is feasible for highly :

(A) Homogenous population

(B) Heterogenous population

(C) Mix population

(D) None

74. In cluster sampling clusters are :

(A) Reverse of strata

(B) Same as strata

(C) Both

(D) None

75. A population have three strata 5000, 2000, 3000 and standard deviations are 15, 18, 15 respectively. How should sample size of 84 be choosen from there strata ?

(A) 50, 48, 10

(B) 100, 24, 10

(C) 50, 24, 20

(D) 50, 24, 10

76. Formula $n_1 = \frac{Sample\ Size \times N_1}{N_1\sigma_1 + N_2\,\sigma_2 + N_3\sigma_3}$ is used for :

(A) Proportionate sampling

(B) Disproportionate sampling

(C) Both

(D) None

77. Disproportionate stratified sampling can be calculated using formula :

(A) $\frac{n_1}{N_1-1} = \frac{n_2}{N_2-2}$ ... ...

(B) $\frac{n_1}{N_1-100} = \frac{n_2}{N_2-100}$ ... ...

(C) $\frac{n_1}{N_1} = \frac{n_2}{N_2} = \cdots$

(D) None

78. More elements are taken from large strata and less element are taken from smaller strata in the sampling type :

(A) Systematic

(B) Double

(C) Cluster

(D) Proportional stratified

79. "The strata are homogenous with them selves and heteroge nous with others." The said sentence is :

(A) True

(B) False

(C) Depend on given data

(D) None

80. For Probability Sampling classification type, which of the following is incor ?

(A) Simple

(B) Stratified

(C) Sequential

(D) None

81. Judgemental Sampling is :

(A) High cost, convinient, quick

(B) Low cost, inconvinient, quick

(C) Low cost, convinient, quick

(D) None

82. Convenience sampling is :

(A) Time consuming

(B) Minimum time consuming

(C) Both

(D) None

83. Convenience sampling is :

(A) Convenient to researcher

(B) Least expensive

(C) Both

(D) None

84. Type of Non probability Sampling is :

(A) Simple

(B) Stratified

(C) Double

(D) None

85. Non Probable Sampling is used in :

(A) Political Science

(B) Social Studies

(C) Scientific

(D) None

86. Non Probability sampling depends on judgment of :

(A) Researcher

(B) People

(C) Any Person

(D) None

87. Which of the following is associated with collection of DATA :

(A) Survey

(B) Field research

(C) Both

(D) None

88. False hypothesis get proved true by collected data in type

(A) I $\alpha$ - error

(B) II $\beta$ -error

(C) Both

(D) None

89. Which of the following is true :

(A) Type-I-α- error

(B) Type – II – $\beta$ – error

(C) Type III – γ-error

(D) None

90. Tertiary sources of literature are :

(A) Very important

(B) Least important

(C) Depend on data

(D) None

91. Secondary sources of literature are :

(A) First hand information

(B) Second hand information

(C) Both

(D) None

92. Second hand information's are characteristic of :

(A) Primary source of literature

(B) Secondary Source of literature

(C) Both

(D) None

93. Critical review of literature can be divided into following type :

(A) Primary

(B) Secondary

(C) Tertiary

(D) All

94. Critical Review of literature involves :

(A) Identification of only broad area

(B) Identification of only narrow objectives

(C) Both

(D) None

95. Review literature involves :

(A) Reading only

(B) Discussion of Past

(C) Identification of future

(D) All

96. Which research has direct impact on problem ?

(A) Pure

(B) Applied

(C) Both

(D) None

97. Good research work should be :

(A) Precise and accurate

(B) Systematic

(C) Logical

(D) All of above

98. Characteristics of good research are :

(A) Promote logical thinking

(B) Ethical standards

(C) Both

(D) None

99. Quantitative research is based on nature :

(A) Quantitative

(B) Qualitative

(C) 50% of both

(D) None

100. Qualitative research data is based on :

(A) General phenomenon

(B) Observations

(C) Both

(D) None

******

**Rough Work / रफ कार्य**

**Rough Work / रफ कार्य**

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1. Examinee should enter his / her roll number, subject and Question Booklet Series correctly in the O.M.R. sheet, the examinee will be responsible for the error he / she has made.
2. **This Question Booklet contains 100 questions, out of which only 75 Question are to be Answered by the examinee. Every question has 4 options and only one of them is correct. The answer which seems correct to you, darken that option number in your Answer Booklet (O.M.R ANSWER SHEET) completely with black or blue ball point pen. If any examinee will mark more than one answer of a particular question, then the first most option will be considered valid.**
3. Every question has same marks. Every question you attempt correctly, marks will be given according to that.
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