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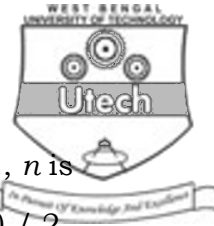
2012
QUANTITATIVE METHODS

Full Marks : 70

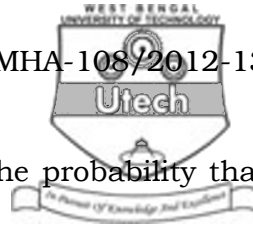
*Candidates are required to give their answers in their own words
as far as practicable.*

1. Choose the correct alternatives for any ten of the following : $10 \times 1 = 10$

- i) The Median of the following data
30, 35, 21, 28, 37, 22, 19, 31, 36, 26
is
- a) 28 b) 30
c) 31 d) 29.
- ii) The Mode of the following data
7, 8, 12, 14, 15, 8, 12, 20, 47, 12, 52, 58
is
- a) 12 b) 8
c) 7 d) 15.
- iii) A student was asked to find the arithmetic mean of the numbers 3, 11, 7, 9, 15, 13, 8, 19, 17, 21, 14 and x . He found the mean to be 12. What should be the number in place of x ?
- a) 3 b) 17
c) 7 d) 31.



- iv) The arithmetic mean of 1, 2, 3,, n is
- a) $(n + 1) / 2$ b) $(n - 1) / 2$
c) $n / 2$ d) $n/2 + 1$.
- v) If mean and median of a frequency distribution are 20 and 17, the mode will be
- a) 12 b) 13
c) 11 d) none of these.
- vi) The root-mean-square-deviation from mean is known as
- a) mean deviation b) standard deviation
c) quartile deviation d) none of these.
- vii) Standard deviation is independent of
- a) origin only b) scale only
c) both (a) and (b) d) none of these.
- viii) If we reject the null hypothesis, we might be making
- a) a type II error b) a type I error
c) a correct decision d) either (a) or (b).
- ix) If $P (A) = 1/2$, $P (B) = 1/3$ and $P (A \cap B) = 1/4$, then $P (A \cup B) =$
- a) $7/12$ b) $9/12$
c) $3/12$ d) $6/12$.
- x) If an event cannot happen, the probability of the event will be
- a) + 1 b) - 1
c) 0 d) none of these.



xi) When two dice are thrown, what is the probability that sum of numbers is an even number ?

- a) $19/36$ b) $12/36$
c) $15/36$ d) $18/36$.

xii) The probability that a non-leap year has 53 Sundays is

- a) $2/7$ b) $5/7$
c) $1/7$ d) $6/7$.

GROUP – B

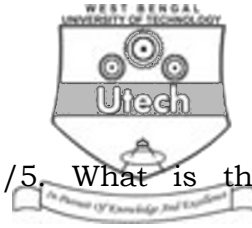
(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Following table has some frequencies missing. Given the total frequency = 90 and median = 57.5. Find the missing frequencies.

Value	30-39	30-39	40-49	50-59	60-69	70-79	80-89	90-99	Total
Frequency	2	12	15	?	18	?	9	4	90

3. In a certain examination, the average grade of all students in class A is 68.4 and all students in class B is 71.2. If the average of both classes combined is 70, what is the ratio of the number of students in class A to the number in class B ?
4. A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is



$1/7$ and that of wife's selection is $1/5$. What is the probability that

- a) both of them will be selected
 - b) only one of them will be selected, and
 - c) none of them will be selected ?
5. Define simple random sampling. Distinguish between simple random sampling and systematic random sampling.
 6. What is hypothesis ? Explain level of significance.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Calculate the standard deviation between x and y .

x	23	27	28	29	30	31	33	35	36	39
y	18	22	23	24	25	26	28	29	30	32

- b) The mean and standard deviation of a set of 100 observations were worked out as 40 and 5 respectively by a computer which by mistake took the value 50 in place of 40 for one of the observations. Find the correct mean and variance.

$10 + 5$



8. a) Marks obtained by 2 students in the two fields x and y are written as follows :

x : 41 45 50 68 47 77 90 100 80 100 40 43

y : 60 63 60 48 85 56 53 91 74 98 65 43

Who is more consistent ?

- b) The average weekly wage for a group of 25 persons working in a factory was calculated to be Rs. 378.40. Later on it was discovered that one figure misread as 160 instead of the correct value Rs. 200. Calculate the correct mean.

12 + 3

9. Age of 42 employees of a company are given as below in years :

22 65 65 67 55 50 65 77 73 30 62 54 48 65

79 60 63 45 51 68 79 83 33 41 49 28 55 61

65 75 55 75 39 87 45 50 66 65 59 25 35 53

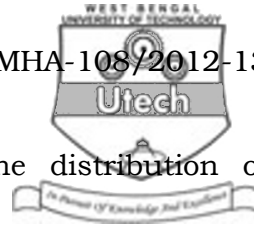
- a) Arrange the data in the form of a frequency distribution table in 6 classes of equal width.
- b) Find the class boundaries and cumulative frequencies (less than type) from the given data.



- c) Draw an ogive for the above data and hence obtain the median value graphically. Check it against the calculated value.
- d) From the above data, calculate the percentage of the employees have age
- i) less than 35.
 - ii) between 35 and 60 and
 - iii) above 60.

10. a) The percentage of literacy in West Bengal is shown below separately for males and females for 4 years :

years	1941	1951	1961	1971
Males	27.4	34.1	40.1	44.8
Females	3.9	12.3	17.0	22.1



- b) Represent the following data of the distribution of expenditure by suitable diagram :

Particulars	Expenditure (Rs. in Lakhs)
Raw materials	1689
Taxes	582
Manufacturing expenses	543
Employees	470
Other expenses	286
Depreciation	94
Dividends	75
Retained income	51
Total Expenditure	3790

7 + 8

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