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Question Bank

APPLIED MATHEMATICS

**1.** Answer the following

1) If p & q are two statements then compound statement p and q is

called \_\_\_\_\_\_

2) If A = (a, b), the power set of A has \_\_\_\_\_ element.

3) The class intervals of the grouped data :

5-9 10-14 15-19 20-24 are of the type……

4) Which one of the following is not a measure of central tendency?

A) Standard deviation B) Mean

C) Median D) Mode

5) The formula of quartile deviation or semi inter-quartile range is \_\_\_

6) Define power set of a set.

7) Define biconditional statement.

8) Define Transitive relation.

9) Define bijective function.

10) State bionomial theorem.

11) If A & B be two finite sets, then |AB | = | A |+| B |- |AB| is the

......

12) A sample space is......

13) A coin is tossed three times in succession and the outcomes are

noted. The number of sample points in the sample space is ......

14) Sample is .....

15) Explain biconditional statement

16) Define bijective function

17) What is symmetric relation?

18) Write pigeon hole principle

19) Define power set of a set.

20) Show that the set of odd positive integers is countable.

21) Prove that for every integer n; 7h –3h is divisiable by 4.

22) Let A = {1, 2, 3, 4, 5, 6}. A relation R is defined on the set A as below

aRb iff a is multiple of b. Find the domain and range of R.

23) 6 men and 5 women sit around a circular dining table in such a way that

no two women are together. How many arrangements will be there?

24) Draw a pie diagram to represent the following data :

Group of item Average monthly expenses (in `) of a family

Food 2400

Clothing 1400

House rent 1600

Fuel & lighting 600

Miscellaneous 2000

25) The following is a distibution of monthly salaries of the employees of a

firm. Compute arithmetic mean of salaries.

Salaries No. of employees

0-500 2

500-1000 8

1000-1500 12

1500-2000 23

2000-2500 25

2500-3000 20

3000-3500 9

3500-4000 1

27) Arithmetic mean of 50 items is 104. While checking it was notice that

observation 98 was misread as 89. Find the correct value of mean.

28) Calculate the coefficient of association between intelligence of fathers

and that of sons given that :

Intelligent fathers will dullsons = 80

Intelligent fathers with intelligent sons = 250

Dull fathers with intelligent sons = 90

Dull fathers with dull sons = 580

29) Let A, B, C be any three events on a sample space . Write expressions

for the events.

i) At least one of the events A, B, C occurs

ii) Only A occurs

iii) A and B occur but not C

iv) All three events occur

30) A random experiment results in an integer outcome between 1 and 10

(both inclusive). All numbers are equally likely. Let A be the event that an

odd number occurs and B be the event that a number divisible by 3

occurs. Obtain

i) P (A|B) ii) P(B|A) iii) P(A|B) iv) P(A |B)

g) If P(A) = 0.6, P(B) = 0.5, P(AB) = 0.3 then find

i) P (A) ii) P(AB) iii) P(AB) iv) P(AB)

31) Show that the following statements are equivalent.

A (B C) (A ~ B) C

32) Write the converse and contrapositive of the following statements :

i) If it is raining then grass is wet.

ii) Rain is necessary for it to be cloudy.

33) There are 325 colleges in a certain state that have atleast one of the three

facilities viz. Hostel facility, credit shop and career guidance facility, 225

colleges have hostel facility, 90 colleges have credit shop facility and 60

have career guidance facility. Further 20 colleges have all three facilities.

Find how many colleges have exactly two of three facilities.

34) Calculate median for the following frequency distribution.

Marks below 20 21-40 41-60 61-80 81-100

No. of students 1 9 32 16 7

35) Calculate standard deviation of the following frequency distribution.

Weight (in kg) 30-40 40-50 50-60 60-70 70-80

No. of standards 3 5 12 20 10

36) Compare correlation between the height of father and son from the

following data :

Height of father (in inches) 65 63 67 64 68 70 68 71

Height of Son (in inches) 68 65 68 65 69 68 71 70

37) Compute regression coefficients and hence verify that correlation

coefficient lies between them.

100, 60, 50, *n*= *x* = *y* = *sx* =10,*sy* =12,å(*x*-*x*)( *y*- *y*)=8400

38) By using truth table show that pq ~p vq

39) Let A = {1, 2, 3, 4, 5} and B = {4, 5, 7, 8, 9, 10}. Define a relation

R from A to B as R = {(a,b): a+b is a perfect square}. Find Dom(R)

and Ran (R).

40) Let *f* :ABsuch that *f* (*x*) *x* 1and g : BCsuch that g(y) = y2

find.

i) (fog) (2)

ii) (gof) (y)

iii) (fof) (y)

41) Show that the set of odd Positive integers is countable.

42) Prove that for every integer n; 7n–3n is divisible by 4.

43) Suppose the arithmetic mean of 50 observations is 120. Find the arithmetic

mean of each observation is.

i) increased by 10

ii) decreased by 5

iii) doubled

iv) reduced to one third

44)) Let A, B, C be any three events on a sample space write expressions

for the events.

i) At least one of the events A, B, C occurs

ii) Only A occurs

iii) A and B occur but not C

iv) All three events occur

45) If P(A) = 0.6, P(B) = 0.5, P(A B) = 0.3 then find

i) P(A)

ii) P(A B)

iii) P(AB)

iv) P(AB)

46) Arithmetic mean of 50 items is 104. While checking it was notice that

observation 98 was misread as 89. Find the correct value of mean.

47) Compute the first quartiles, second quartiles and third quartiles for the

following series of observations.

26, 30, 35, 5, 6, 7, 9, 20, 40, 45, 11, 18, 15, 49, 60

48) Find correlation coefficient between X and Y, given that

*n* 25, *x* 75, *y* 100, *x*2 250, *y*2 500, *xy* 325.

49) How many positive integers less than or equal to 1000 are divisible either

by 3 or 5 or 11?

50) Determine which is a tautology or Fallancy.

i) (pq) qp)

ii) (pq)(pq)

51) Write the converse and contrapositive of the following statements

i) If it is raining then grass is wet

ii) Rain is necessary for it to be cloudy

52) Calculate median for the following frequency distribution

Marks below 20 21-40 41-60 61-80 81-100

No.of Students 1 9 32 16 7

53) Compare correlation between the height of father and son from the

following data.

Height of father (in inches) 65 63 67 64 68 70 68 71

Height of son (in. inches) 68 65 68 65 69 68 71 70

54) The number of runs scored by cricketers A and B in 5 test matches are

show below

A 5 20 90 76 102 90 6 108 20 16

B 40 35 60 62 58 76 42 30 30 20

find

i) Which cricketer is better in average?

ii) Which cricketer is more consistent?

55) The total daily sell of a departmental store exceeds ` 10,000 with

probability 1/3. Suppose the store is open on 6 days in week. Find the

probability that the sell will exceed ` 10,000.

i) on 4 days

ii) on atleast 2 days

iii) on at most 1 day

iv) on exactly 2 days