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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