Q.P. CODE: 38183

Duration: 3 Hrs **Total Marks: 80**

N.B: (1) Question 1 is **compulsory.**

(2) Attempt any **Three questions** out of remaining **Five questions.**

(3) Assume any **additional data**, if required , but **justify the same.**

(4) **Figures** to the **right** indicate **full marks** for that question.

(5) Use of **Scientific calculator** is **allowed.**

Q.1) a) The Mean & standard deviation of 300 items are found to be 50 and 20 respectively. It is found that at the time of the calculation two items were wrongly taken as 7 and 52 instead of 15 and 26,Find the correct mean and Standard deviation. **[5]**

b) The probability that a person stopping at a petrol pump will ask for petrol is 0.8, will ask for water is 0.7 and for both 0.65.Find the probability that a person will ask for i)either petrol or water ii)neither petrol nor water iii)only petrol **[5]**

c) Calculate the model marks of the following **[5]**

Marks	10-30	30-50	50-70	70-90	90-110	110-130
No. of students	4	10	14	12	8	6

d) Find the missing frequency of the following **[5]**
If mode= 136 cms

Class interval	120-125	125-130	130-135	135-140	140-145	145-150
frequency	7	10	18	?	12	7

Q.2)a) The Joint probability density function of the two dimensional random variable (X,Y) is given by

$f(x,y)=8/9xy, \quad 1\le x\le y\le 2$

$=0, \quad$ otherwise

a)Find the marginal densities of X and Y.

b)Find the conditional density function of Y given X=x.and conditional density function of X given Y=y. **[10]**

b) Compute the inter quartile, semi-inter quartile range and coefficient of quartile deviation from the following data. **[10]**

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No.of students	65	45	120	25	90	80	120	60

Q.3) a) The age of husband and wives in seven couples were as follows: **[10]**

Age of husband	45	44	50	53	66	30	48
Age of wife	42	40	41	42	56	30	43

Find the Karl Pearson's coefficient of correlation between age of husband and age of wife.

b) i) A Man is equally likely to choose any one of the routes A,B,C from his house to railway station this choice of route A,B,C from his house to railway station and this choice of routes is not affected by whether. If whether is dry the probability of missing train by routes A,B,C are
respectively 1/20,1/10,1/5.He sets out on dry day and missed the train.
What is the probability that train chosen was C? **[5]**

ii) The probability mass function of a random variable x is zero
Expect at the points x=0,1,2 At these points it has the values
$P(0)=3c^2$,$P(1)=4c-10c^2$ and $P(2)=5c-1$,for some $c>0$
i)Determine the value of c ii) Compute the $P(X<2)$ **[5]**

Q.4)a) Calculate Bowley's coefficient of skewness for the following distribution. **[10]**

Class	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	7	9	16	22	14	12	3

b) Weights in kg of 10 students are given below
38,40,45,53,47,43,55,48,52,49
Can we say that the variance of the normal distribution from which the above sample is drawn is 20 kg?
(Given: The value of χ^2 at 5% level of significance for 9 degree of freedom is 16.99) **[10]**

Q.5)a) i) What is the probability that 4 A's come consecutively in arrangements of the letters in the word 'MAHARASHTRA' ? **[5]**

ii) Consider an experiment "three coins are tossed". Let the random variable
X='number of heads' **[5]**

a) Find the values of X
b) Find the probability of X
c) Find the probability mass function d) Find the cumulative distribution function

b) Find the Spearman's rank correlation of the following data **[10]**

Marks in D.M	64	50	44	42	56	65	59
Marks in C.O.A	80	60	37	51	30	75	44

Q.6)a) i) Find the probability of constructing two-digit even number using the digits 1,2,3,4,5,6,7,8,9.

If 1) Repetition of digits is allowed 2) Repetition of digits is not allowed. **[5]**

ii) Find the coefficient of variation for the following distribution. **[5]**

Age in years	20-25	25-30	30-35	35-40	40-45	45-50
No of policyholders	2	7	5	2	4	5

b) i) Ram plays 12 game of chess with computer and he wins 6 games while computer wins 4 games and 2 games end in a tie. Ram again decides to play 3 games more.

Find the probability that-

i)Ram wins all three games.

ii)Two games end in a tie. **[5]**

ii) Calculate the mean, median & mode for the following **[5]**

i)16,19,27,10,5,7,12,15

ii)4,1,3,2,3,4,3,3,1,2,5,2,0,1,6

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