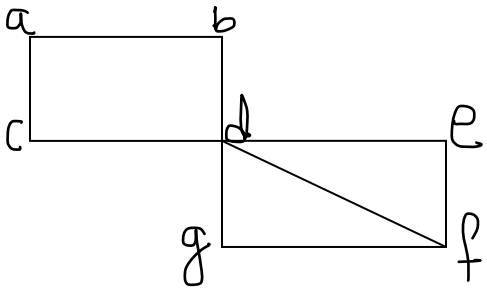




PILLAI COLLEGE OF ENGINEERING, NEW PANVEL
(Autonomous) (Accredited 'A+' by NAAC)
END SEMESTER EXAMINATION
May 2023(SEM IV)

BRANCH: Computer Engineering/Information Technology

Subject:- Engineering Mathematics-IV	Time: 02.00 Hours
Max. Marks: 60 N.B 1. Q.1 is compulsory 2. Attempt any two from the remaining three questions 3. Each Question carry 20 marks.	Date:02 /05 /2023 Subject Code CE208/IT207

Q.1.	Attempt All	Marks
a)	Find from the following values of the demand and the corresponding price of a commodity, the degree of correlation between the demand and price by computing Karl Pearson's coefficient of correlation. Demand in quintals : 65 , 66, 67, 67,68, 69, 70, 72 Price in Paise per k.g: 67, 68, 65, 68, 72, 72, 69, 71	5
b)	Draw the Hasse diagram of the poset $A=\{2,3,6,12,24,36,72\}$ under the relation of divisibility. Is it a Lattice?	5
c)	(i) A random variable X has the probability distribution $\begin{array}{cccccc} X & : & -2 & -1 & 0 & 1 & 2 & 3 \\ P(X) & : & 0.1 & k & 0.2 & 2k & 0.3 & k \end{array}$ Find k and the mean and the variance of X. (ii) If hens of a certain breed lay eggs on 5 days a week on an average; find on how many days during a season of 100 days, a poultry keeper with 5 hens of this breed, will expect to receive at least 4 eggs	3 2
d)	(i) Discuss whether the following graph have Eulerian path, Eulerian circuit, Hamiltonian path, Hamiltonian circuit?  (ii) Show that the given graph is bipartite.	3

		2
Q.2.	Attempt All	
a)	A fertiliser mixing machine is set to give 12kg of nitrate for quintal bag of fertiliser. Ten 100 kg bags are examined, the part of nitrate per bag are as follows: 11,14,13,12,13,12,13,14,11,12 Is there any reason to believe that the machine is defective? (Value of t for 9 degrees of freedom is 2.262)	4
b)	If Z^+ is a set of positive integers and R is a relation such that aRb if 'a divides b' then prove that R is partial order relation. And find two elements which are not comparable.	4
c)	(i) Find a positive integer which leaves the remainder 2 if divided by 3, the remainder 3 if divided by 5, the remainder 2 if divided by 7. (ii) Using Euclidean algorithm, prove that (143,227) are relatively prime.	4 2
d)	The average selling price of houses in a city is Rs 50,000 with standard deviation of Rs.10,000. Assuming the distribution of selling price to be normal find (i) the percentage of houses that sell for more than Rs 55,000, (ii) the percentage of houses selling between Rs 45,000 and Rs.60,000. (Area between $z=0$ to $z=1$ is 0.3413 and between $z=0$ to $z=0.5$ is 0.1915)	6
Q.3.	Attempt All	
a)	Two lines of regression are given by $5y - 8x + 17 = 0$ and $2y - 5x + 14 = 0$. If $\sigma_y^2 = 16$, find (i) the mean values of x and y (ii) σ_x^2, (iii) the coefficient of correlation between x and y.	4
b)	Using Fermat's theorem find the least positive remainder of 3^{201} modulo 11.	4
c)	Find whether the following graphs are isomorphic? G G'	6

