# CMR COLLEGE OF ENGINEERING & TECHNOLOGY

**(UGC AUTONOMOUS)**

**B.Tech III-Semester Assignment Feb– 2023 A.Y: 2022-23**

**Numerical Techniques and Probability Distributions**

**Max Marks:05**

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**Answer all FIVE questions (Compulsory) 5x1=5M**

| Q.No. | Question | CO | BTL |
|---|---|---|---|
| 1 | Solve the differential equation $\frac{d^2x}{dt^2} + 9x = sint$ using Laplace transforms given that x (0) =1, $x\left(\frac{\pi}{2}\right) = 1$ | 3 | L2 |
| 2 | Find the probability that at most 5 defective components will be found in a lot of 200. Experience shows that 2% of such components are defective .Also find the probability of more than five defective components. | 4 | L3 |
| 3 | Samples of size 2 are taken from the population 1, 2, 3,4,5,6 (i) with replacement and (ii) without replacement. Find (i)The mean of the population (ii) Standard deviation of population (iii) The mean of the sampling distribution of means (iv) The standard deviation of the sampling distribution of means. | 4 | L2 |
| 4 | In a normal distribution 31% of the items are under 45 and 8% are over 64. Find the mean and variance of the distribution | 5 | L1 |
| 5 | From the following data, find whether there is any significant liking in the habit of taking soft drinks among the categories of employees. | 5 | L3 |

| | Employees | | |
|---|---|---|---|
| Soft Drinks | Clerks | Teachers | Officers |
| Pepsi | 10 | 25 | 65 |
| Thumsup | 15 | 30 | 65 |
| Fanta | 50 | 60 | 30 |