YeshwantraoChavan College of Engineering, Nagpur
Department of Mathematics & Humanities
MSE-1: EVEN 2021-22
Subject: Probability Theory & Statistical Inference

Time: 1.5 Hrs. **Branch: AIDS/CSD/AIML/IIOT-2151** **Max. Marks: 30**

1a	Three Machines A, B, and C produces respectively 60%, 30%, and 10% of the total number of items of a factory. The Percentages of defective output of these machines are respectively 2%, 3% and 4%. an Item is Selected at random and is found defective. Find The probability that the item the item was produced by i) Machine A ii) Machine C	5	CO2	L2
1b	A continuous random variable X has density function Let $f(x) = \begin{cases} kx^2, & 1 \le x \le 2 \\ kx, & 2 < x < 3 \\ 0, & \text{otherwise} \end{cases}$ Find (i) Constant k, (ii) Distribution function of random variable X.	5	CO2	L2
2a	A random variable X is defined as x: -2, 3, 1 f(x): 1/3, 1/2, 1/6 Find (i) E(X), ii) $E(X^2)$, iii) V(X), iv) $\sigma(X)$, v) $E(X^2 + 5X)$.	5	CO2	L2
2b	A continuous random variable X has density function $f(x) = \begin{cases} 2e^{-2x}, & x > 0 \\ 0, & x \le 0 \end{cases}$ Find (i) Moment generating function (ii) First four moments about the Mean & origin	5	CO2	L2
3a	on an average if one ship in every 10 ship is wrecked. Find probability that out of 5 ships excepted to arrive safely. i) Atleast 4 ii) Atmost 3 iii) Between 2 % 4(Inclusive) iv)None.	5	CO3	L3
3b	An aptitude test for selecting engineers in an industry is conducted on 100 candidates. The average score is normally distributed with mean 42 & std deviation is 24. Find Number of candidates whose score i). Greater than 60 ii) lie between 30 and 60 iii) Less than 60	5	CO3	L3