PQT (Sem-IV)

UNIT-1 (12M)

① Random variable
② Chebychaffi's Inequality } MOST asked
③ cdf / pdf
④ MGF, mean + variance

~~MOST~~ .

UNIT-2 (12M)

① ~~MGF of~~ binomial dist.
② Poisson dist.
③ Out of 800 families, 4 children ...

UNIT-3 (12M)

① Normal population
② Null Hypothesis sums

UNIT-4 (12M)

① (M|M|1):(∞|FIFO) (Type1)
② (M|M|1):(K|FIFO) (Type2)

UNIT-5 (12M)

① steady state
② TPM

MOST-asked questions

UNIT-1

① A fair die is tossed 720 times. Use
(X) chebychaffi's to find lower bound for probability of getting 100 to 140 sixes

②

x	-2	-1	0	1	2	3
$P(x)$	0.1	K	0.2	$2K$	0.3	$3K$

(X) (i) Find K (ii) $P(X<2) + P(-2<X<2)$
(iii) cdf of X (iv) mean of X
(v) variance of X

③ Dist fn of R.V. X is $F(x) = 1-(1+x)e^{-x}, x \geq 0$
Find density fn, mean, variance of X

UNIT-2

① Binomial dist.

x	0	1	2	3	4	5	6	Total
$f(x)$	5	18	28	12	7	6	4	80

② In an engineering exam, student is considered to have failed, secured second class, first class and distinction according as he scores less than 45%, blw 45 & 60%, blw 60% & 75% & above 75% resp. In a particular year 10% of student failed in exam & 5% got distinction. Find first class & second class percentage

③ Out of 800 families with 4 children each, how many families expected to have (i) 2 boys & 2 girls (ii) atleast 1 boy (iii) atmost 2 girls (iv) children of both sexes

④ Assume mean height = 68.22 inches with variance $10.8\ \text{inch}^2$. How many soldiers in regiment of 1000 is expected to be more than 6ft?

UNIT-3

①
S1	19	17	15	21	16	18	16	14
S2	15	14	15	19	15	18	15	

Test whether they're drawn from same normal population

② Theory predicts that proportion of beans in 4 groups A, B, C, D should be 9:3:3:1. In expt. of 1600 beans numbers were 882, 313, 287 & 118. Does the expt. support theory?

③
Test 1	19	23	16	24	17	18	20	18	21	19	20
Test 2	17	24	20	24	20	22	20	20	18	22	19

Are the students benefitted?

④ Group of 5 patients treated with medicine 'A' weighs 42, 39, 48, 60, 41 kgs second group treated with 'B' weighs 38, 42, 56, 64, 68, 69 & 62 kg. Do you agree with the claim that medicine B decreases weight?

⑤
Sample	size	Mean	variance
1	8	9.6	1.2
2	11	16.5	2.5

Are they drawn from same normal population?

UNIT-4

1. Telephone booth 
2. Barber shop  (Type1 + Type2)
3. Clinic 
4. Departmental store 

UNIT-5

1. 3 boys A, B, C .... 
2. salesman
3. Car or Train
4. Fair die 
5. 2 boys + 2 girls 
6. TPM of Markov chain 

$$P = \begin{pmatrix} 0.1 & 0.5 & 0.4 \\ 0.6 & 0.2 & 0.2 \\ 0.3 & 0.4 & 0.3 \end{pmatrix} \qquad P^0 = (0.7, 0.2, 0.1)$$

(i) $P\{X_2 = 3\}$ (ii) $P\{X_3 = 2, X_2 = 3, X_1 = 3, X_0 = 2\}$

(iii) $P(X_3 = 3 / X_2 = 1, X_1 = 2)$