TIME : 2 Hrs

MARKS : 60

N. B.: 1. All questions are compulsory.

2. Figures to the right indicate marks.

Q.1 a. If $P(A \cup B) = \dfrac{19}{24}$, $P(A) = \dfrac{3}{8}$ (1)

$P(A \cap B) = \dfrac{1}{4}$, Find P(B)

OR

a. A coin is tossed thrice. Describe the sample space for the experiment. (1)
Write the subset of the sample space corresponding to the event A : the
number of heads is less than the number of tails.

b. **Attempt Any Two questions out of three from the following.**

1. Explain with the help of suitable examples.   (7)

p Event

q Mutually exclusive events

r Exhaustive events

s complementary events

2. One card is drawn from a full pack of well shuffled 52 cards. Find   (7)
the probability that it is:

p   a diamond or a king

q   red or ace

3. A problem is given to three students A, B and C, whose chances of   (7)
solving it are ½ , ⅓ and ¼ respectively. If all of them try independently,
find the probability that the problem will be solved.

Q.2 a. Define cumulative probability distribution function of a discrete random   (1)
variable.

OR

a. Determine whether P(x) can be regarded as probability distribution   (1)
function .

x	-2	-1	0	1	2
P(x)	$\dfrac{1}{16}$	$\dfrac{1}{8}$	$\dfrac{1}{2}$	$\dfrac{1}{4}$	$\dfrac{1}{16}$

b. **Attempt Any Two questions out of three from the following.**

1. Define raw and central moments of a random variable. State   (7)
recurrence relationship between raw and central moments for first
three moments. Show that $\mu_2 = \mu_2^1 - \mu_1^{1^2}$

N. B.:　　1.　All questions are compulsory.

　　　　　　2.　Figures to the right indicate marks.

Q.1　a.　If　$P(A \cup B) = \dfrac{19}{24}$ `,　$P(A) = \dfrac{3}{8}$　　　　　　　　　　　　　　**(1)**

　　　　　$P(A \cap B) = \dfrac{1}{4}$,　Find P(B)

<div align="center">OR</div>

　a.　A coin is tossed thrice. Describe the sample space for the experiment.　**(1)**
Write the subset of the sample space corresponding to the event A : the
number of heads is less than the number of tails.

　b.　**Attempt Any Two questions out of three from the following.**

　　1.　Explain with the help of suitable examples.　　　　　　　　　　　**(7)**

　　　　p　Event

　　　　q　Mutually exclusive events

　　　　r　Exhaustive events

　　　　s　complementary events

　　2.　One card is drawn from a full pack of well shuffled 52 cards. Find　**(7)**
the probability that it is:

　　　　p　a diamond or a king

　　　　q　red or ace

　　3.　A problem is given to three students A, B and C, whose chances of　**(7)**
solving it are ½ , ⅓ and ¼ respectively. If all of them try independently,
find the probability that the problem will be solved.

Q.2　a.　Define cumulative probability distribution function of a discrete random　**(1)**
variable.

<div align="center">OR</div>

　a.　Determine whether P(x) can be regarded as probability distribution　**(1)**
function .

x	-2	-1	0	1	2
P(x)	$\dfrac{1}{16}$	$\dfrac{1}{8}$	$\dfrac{1}{2}$	$\dfrac{1}{4}$	$\dfrac{1}{16}$

　b.　**Attempt Any Two questions out of three from the following.**

　　1.　Define raw and central moments of a random variable. State　**(7)**
recurrence relationship between raw and central moments for first