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Question No. 1:

400 people are classified according to their monthly salary as follows:

Mo nthly salary	No. People
(L) Less than 3000	50
(B) Between 3000 and 8000	200
(M) More than 8000	150

The percentage of male in each salary group are 40%, 60% and 80% respectively. A person was chosen randomly.

(1) The probability that the person is a male =

(A)	**0.45**
(B)	0.65
(C)	0.18
(D)	1.00

(2) If it is known that the person is a male, then the probability that his salary less than 3000:

(A)	**0.0769**
(B)	0.1769
(C)	0.2769
(D)	0.5769

Question No. 2:

A continuous random variable X has a cumulative distribution function F(x) as follows:

$$F(x)=\begin{cases} 0 & x<0 \\ x/4 & 0\le x<1 \\ x^2/4 & 1\le x<2 \\ 1 & x\ge 2 \end{cases}$$

(3) P(X>1)

(A)	0.25
(B)	0.50
(C)	**0.75**
(D)	1.00

(4) P(X=2)=

(A)	1.0
(B)	**0.0**
(C)	0.5
(D)	2.0

(5) P(1.0<X<2.0)=

(A)	1.00
(B)	**0.75**
(C)	0.50
(D)	0.25

Question No. 3:

In a certain Class of STAT 324, it is known that 60% of the students are from engineering college. A random sample of 4 students is selected at random. Let X represents the number of engineering students in the sample.

(6) The probability that there will be exactly one engineering student in the sample is

(A)	0.6352
(B)	0.2736
(C)	0.2536
(D)	**0.1536**

(7) The expected number (mean) of engineering students in the sample is

(A)	0.6
(B)	0.4
(C)	**2.4**
(D)	2.0

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Question No. 4:

If the probability density function is given by $f(x) = 3x^2$ for 0<x<1, then:

(8) P(X>0.5) equals:

(A)	0.975
(B)	**0.875**
(C)	0.775
(D)	0.675

(9) $E(X^2)$ equals:

(A)	**0.6**
(B)	0.5
(C)	0.4
(D)	0.3

(10) If F(x) is the cumulative distribution function (CDF) of X, then F(0.5) equals:

(A)	**0.125**
(B)	0.225
(C)	0.325
(D)	0.425

Question No. 5:

A random committee of size 3 is selected from 2 chemical engineers and 4 industrial engineers. Let X representing the number of chemical engineers in the committee.

(11) The number of possible committees are

(A)	5
(B)	12
(C)	6
(D)	**20**

(12) The probability that there will be no industrial engineers in the selected committee is

(A)	0.65
(B)	0.45
(C)	0.05
(D)	**0.0**

(13) the mean of the random variable X will be

(A)	2.0
(B)	1.5
(C)	**1.0**
(D)	0.5

Question No. 6:

The random variable, X, representing the number of patients arriving to the emergency department in a certain hospital has a Poisson distribution with an average of 2 patient per an hour.

(14) The probability that exactly 3 patients will arrive during a period of two hours to this emergency department is:

(A)	**0.1954**
(B)	0.2954
(C)	0.3954
(D)	0.4954

(15) The probability that exactly 2 patients will arrive during an hour to this emergency department is:

(A)	**0.2707**
(B)	0.2804
(C)	0.3804
(D)	1.0

(16) The variance of the number of patients arriving to this emergency department during a day is:

(A)	**48**
(B)	24
(C)	12
(D)	6

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Question No. 7:

Suppose that the events A and B are defined on the same sample space such that: P(A)=0.3 and P(B)=0.6,

(17) If A and B are independent then P(B|A)=

(A)	0.0
(B)	0. 3
(C)	**0.6**
(D)	0.18

(18) If A and B are disjoint then P(A|B)=

(A)	**0.0**
(B)	0. 3
(C)	0.6
(D)	0.18

(19) If $A \subset B$ then P(A|B)=

(A)	0.12
(B)	**0.50**
(C)	0.22
(D)	0.30

Question No. 8:

Suppose that X~ Binomial(5,0.4) and Y~ Poisson(4) are independent random variables. Then

(20) $E(X^2)$

(A)	2.2
(B)	3.2
(C)	4.2
(D)	**5.2**

(21) Var(2X-Y)

(A)	20.8
(B)	**8.8**
(C)	2.8
(D)	0.8

Question No. 9:

60 people are classified according to their nationality and monthly salary as follows:

	Nationality	
Monthly salary	(S) Saudi	(N) Non-Saudi
(L) Less than 3000	5	8
(B) Between 3000 and 8000	20	5
(M) More than 8000	15	7

Suppose that one person is randomly selected from this group of people.

(22) The probability that the salary of the selected person is less than 3000 equals:

(A)	0.1167
(B)	0.9167
(C)	0.5167
(D)	**0.2167**

(23) If it is known that the selected person is Saudi, then the probability that his salary is less than 3000 equals:

(A)	0.825
(B)	0.225
(C)	**0.125**
(D)	0.025

Question No. 10:

Suppose that the mean and the variance of a random variable, X, are: $\mu = 50$ and $\sigma^2 = 16$, then:

(24) The approximated value of P(38<X<62) is:

(A)	0.9999
(B)	**0.8889**
(C)	0.7778
(D)	0.6667

(25) $Var(10X + 100)$ equals:

(A)	16
(B)	160
(C)	**1600**
(D)	16000

THE END

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