

**STT211 List of eExam Questions in the Bank**

*Latex formatted questions may not properly render*

**Q1** out of 5 Mathematicians and 7 physicists, a committee consisting of 2 mathematicians and 3 physicists is to be formed. In how many ways can this be done if any mathematician and any physicist can be included?

**Q2** Two petrol station are located in a street at Victoria island, each of the petrol station has 5 pumps, an experiment was carry out to determine the number of pumps in use at a particular time of the day at each of the petrol station, assume an experimental outcome is  $(x,y)$ , where  $x$  specified the number of pumps in use at the 1st station and  $y$  the number of pumps in use at the second station. How many of such outcome will you have in this experiment?

**Q3** Evaluate  $(x-2)!(y-4)$  if  $x=6$  and  $y=9$

**Q4** Set  $X$  has 8 elements and set  $Y$  has 10 elements, if there are 5 common elements in  $X$  and  $Y$ , what is the cardinality of  $X$  union  $Y$ ?

**Q5** In how many way can 6 people take place at a round table?

**Q6** how many 3 digits numbers greater than 300 can be formed using the digits 1, 2, 3, 4, 5 if no digit can be repeated and the first digit cannot be 3?

**Q7** A bus starts with 6 people and stops at 10 different stops. how many different ways can the 6 people depart if any passenger can depart at any bus stop

**Q8** How many runs of L do your have in the following sequences  
WWWLWLLWWLWWLWWW

**Q9** Among the 120 applicants for a job, only 80 are actually qualified. If five of the applicants are randomly selected for an in- depth interview, find the probability that only two of the five will be qualified for the job (answer to 3 decimal places)

**Q10** in a given business venture a lady can make a profit of N300 with probability 0.6 or take a loss of N100 with probability 0.4. what is her expectation?N

**Q11** if a man purchases a rafle ticket, he can win a first prize of N5000 or a second prize of N2000 with probabilities 0.001 and 0.003. what should be a fair price to pay for the ticket? N

**Q12** Find the probability that a random variable having the standard normal distribution will take on a value less than -0.88 (answer to 4 decimal places)

**Q13** If  $X$  has the probability density  $f(x)=k.e^{-3x}$  for  $x>0$ , find the value of  $k$

**Q14** Which law states that  $P(A \cap B)^c = A^c \cup B^c$ ? It is \_\_\_\_\_ Law

**Q15** When  $P(A \cap B) = P(A) \cdot P(B)$ , events A and B are said to be \_\_\_\_\_

**Q16** A certain shop repairs both audio and video components. Let A denote the event that the next component brought in for repair is an audio component, and let B be the event that the next component is a compact disc player (so the event B is contained in A). Suppose that  $P(A) = 0.6$  and  $P(B) = 0.05$ . What is  $P(B|A)$ ?

- 0.042
- 0.44
- 0.083
- 0.25

**Q17** When you toss 5 coins once, if the number of head(s) is the random variable define on the resulting sample space. What is the set of random variable resulting from this experiment?

- $\{1, 2, 3, 4, 5\}$
- $\{2, 4, 5\}$
- $\{2, 3, 4, 5\}$
- $\{0, 1, 2, 3, 4, 5\}$

**Q18** A \_\_\_\_\_ random variable is memoryless

- exponential
- normal
- gamma
- uniform

**Q19** If x is a normal variable with the mean  $\mu = 5$  and variance ( $\sigma^2$ ) = 16, what is the probability that x is less than or equal to 6?

- 0.3681
- 0.5987
- 0.5732
- 0.4123

**Q20** Let X have a standard gamma distribution with  $\alpha = 7$ . Compute  $P(X < 4 \text{ or } X > 6)$

- 0.671
- 0.535
- 0.713
- 0.824

**Q21** Let X have a uniform distribution on the interval [A,B]. compute  $V(X)$

- $\frac{A-2B}{\sqrt{A}}$
- $\frac{2B-A}{\sqrt{12B}}$
- $\frac{4B-A}{\sqrt{3AB}}$
- $\frac{B-A}{\sqrt{12}}$

**Q22** In a study of plants, five characteristics are to be examined. If there are six

recognizable differences in each of four characteristics and eight, recognizable difference in the remaining characteristics. How many plants can be distinguished by these five characteristics?

- 120
- 60
- 55
- 70

**Q23** A student is to answer all the nine questions in an examination. It is believed that the sequence in which the questions are answered may have a considerable effect on the performance of the student. In how many different order can the question be answered

- 120200
- 360
- 362880
- 480

**Q24** A coin is rolled thrice, what is the probability for an event that at least two head or at least two tails occurs?

- $(1/2)$
- $(2/3)$
- $(7/3)$
- $(1/4)$

**Q25** The 3rd and 7th term of a G.P. are 81 and 16 respectively, find the 1st and 5th term

- 250 and 43
- $729/4$  and 36
- 120 and 24
- $402/5$  and 53

**Q26** For a sequence 128, 64, 32, ..... what is the value 12th term of this sequence?

- $(1/16)$
- $(1/32)$
- 2
- 4

**Q27** Given two set  $A=\{5,6,7,8,9,10\}$  and  $B=\{x:5 < x < 10\}$ . Find  $A/B$

- $\{5,6\}$
- $\{6,8\}$
- $\{5,10\}$
- $\{9,10\}$

**Q28** Suppose a factory has three machines M1, M2, M3 which produce 60%, 30% and 10% of the total production respectively. Of their output, machine M1 produces 2% defective items, machine M2 produce 3% defective items while machine M3 produces 4% defective items. Find the probability that a part selected at random is defective.

0.054  
0.253  
0.125  
0.025

**Q29** Identify the expression for the moment generating function of a poisson random variable

$e^{\lambda}(e^t - 1)$   
 $e^{\alpha}(t^e - 2)$   
 $e^{\Gamma}(e^t - 1)$   
 $e^{\beta}(e^{2t} - 3)$

**Q30** If the probability is 0.40 that a child exposed to a certain contagious will catch it, what is the probability that the tenth child exposed to the disease will be the third to catch it?

0.0523  
0.2333  
0.0645  
0.6451

**Q31** Two fair dies are rolled once. Find the probability that the sum of the numbers on the two faces is greater than Ten

$\frac{2}{5}$   
 $\frac{1}{12}$   
 $\frac{1}{6}$   
 $\frac{3}{4}$

**Q32** The rth moment about the origin of the gamma distribution is given by

$\frac{\beta^r}{\Gamma(\alpha + r)} \Gamma(\beta)$   
 $\frac{\alpha^r}{\Gamma(\alpha + r)} \Gamma(\alpha)$   
 $\frac{\beta^r}{\Gamma(\beta + r)} \Gamma(\alpha)$   
 $\frac{\beta^r}{\Gamma(\alpha + r)} \Gamma(\alpha)$

**Q33** For X a continuous random variable with pdf  $f(x) = \lambda e^{-\lambda x}$ , for x greater than zero and less than infinity, find the mean of

$\frac{1}{\beta}$   
 $\frac{1}{\lambda}$   
 $\frac{1}{\alpha}$   
 $\frac{1}{e}$

**Q34** Find the expected value of the random variable Y whose probability density is given by  $f(y) = \frac{1}{8}(y+1)$  for  $2 < y < 4$

$\frac{37}{12}$   
 $\frac{41}{12}$   
 $\frac{30}{13}$   
 $\frac{16}{17}$

**Q35** A random variable having its probability density function given by  $P(x) = \binom{x-1}{r-1} p^r (1-p)^{x-r}$  is called \_\_\_\_\_

Binomial  
Exponential  
Negative Binomial  
Weibull

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