Unit V	PROBABILITY DISTRIBUTION	Marks - 12

S. N.	MSBTE Board Asked Questions	Exam Year	Marks
1.	An unbiased coin is tossed 5 times. Find the probability of getting a head.	S-18 W-18 W-22 W-09	2
2.	An unbiased coin is tossed 5 times. Find the probability of getting three heads.	S-19 W-19	2
3.	If the coin is tossed three times. Find the probability of getting exactly two Heads.	S-22 W-19	2
4.	An unbiased coin is tossed 5 times. Find the probability of getting 2 tails.	S-19	2
5.	If two coins tossed simultaneously. Find the probability of getting at least one head.	S-22	2
6.	Three fair coins are tossed. Find the probability that at least two heads appear.	W-17	2
7.	An unbiased coin is tossed 6 times. Find probability of getting 2 Heads.	W-18 W-19 W-07	2
8.	If unbiased coin is tossed 6 times, find the probability of getting 4 heads.	W-22 S-22	2
9.	An unbiased coin is tossed 6 times. Find the probability of getting (i) 2 head (ii) Exactly 4 heads	S-11	2

10.	**A person fires 10 shots at target. The probability that any shot will hit the target 3/5. Find the probability that the target is hit exactly 5 times.**	**S-18**	**3**
11.	**If 20% of the bolts produce by a machine are defective. Find the probability that out of 4 bolts drawn,** **i) One is defective.** **ii) At the most two are defective.** **iii) Atleast one is defective.**	**S-18** **S-22** **W-22**	**3** **6**
12.	**The probability that a man aged 65 will live to 75 is 0.65. What is the probability that out of 10 men which are now 65, 7 will live to 75.**	**S-19** **W-19**	**3**
13.	**The probability that a bomb dropped from a Plane will strike the target is 51. If six bombs are dropped, find the probability that exactly two will strike the target.**	**S-19**	**3**
14.	**On an average 2% of the population in an area suffer from T. B. What is the probability that out of 5 persons chosen at random from this area, at least two suffer from T. B.?**	**W-18**	**3**
15.	**10% of the component manufactured by company are defective. If twelve components selected at random, find the probability that at least two will be defective.**	**W-18**	**3**
16.	**Fit a poisson's distribution for the following observations.** x_i: 20 30 40 50 60 70 f_i: 8 12 30 10 6 4	**W-18** **S-19**	**3**
17.	**Assuming that 2 in 10 industrial accidents are due to fatigue. Find the probability that exactly 2 out of 8 accidents will be due to fatigue.**	**S-05** **S-16** **S-09** **W-22**	**3**
18.	**If 3% of the electric bulbs manufacture by a company are defective. Find the probability that in a sample of 100 bulbs. Exactly 5 bulbs are defective** **(Given e^{-3}= 0.0497).**	**W-22**	**3**
19.	**A company manufacture electric motors. The probability that an electric motor is defective is 0.01. What is the probability that a sample of 300 electric Motors will contains exactly 5 defective motors?** **(Given e^{-3} = 0.0498)**	**S-18** **W-22**	**6**
20.	**In a sample of 1000 cases the mean of certain test is 14 and standard deviationis 2.5. Assuming the distribution to be normal, find** **i) How many students score above 18?** **ii) How many students score between 12 and 15?** **[Given : A(0.4) = 0.1554, A(0.8) = 0.2881, A(1.6) = 0.4452]**	**S-18** **W-22**	**6**

21.	**If 2% of the electric bulbs manufactured by company are defective, find the probability that in a sample of 100 bulbs,** **i) 3 bulbs are defective,** **ii) At the most two bulbs will be defective.** **(e^{-2}= 0.1353)**	**S-19**	**6**
22.	**In a test on 2000 electric bulbs, it was found that the life of particular make was normally distributed with average life of 2040 hours and standard deviation of 60 hours. Estimate the number of bulbs likely to burn for:** **i) Between 1920 hours and 2160 hours.** **ii) More than 2150 hours.** **Given that: A (2) = 0.4772** **A (1.83) = 0.4664**	**S-19, S-23**	**6**
23.	**If the probability of a bad reaction from the certain injection is 0.001, determine the chance that out of 2000 individuals more than two will get a bad reaction. (Given e^{2}= 7.4)**	**S-22, S-18, W-19**	**6**
24.	**In a sample of 1000 cases the mean of certain test is 14 and S.D is 2.5. Assuming the distribution to be normal. Find** **i) How many students score between 12 and 15?** **ii) How many students score above 18?** **[Given : A (0.8) = 0.2881, A (0.4) = 0.1554, A (1.6) = 0.4452]**	**S-22 W-23**	**6**
25.	**The number of road accidents met with by taxi drivers follow Poissondistribution with mean 2 out of 5000 taxi in the city, find the number of drivers.** **i) Who does not meet an accident?** **ii) Who met with an accidents more than 3 items? (Given e^{-2} = 0.1353)**	**W-18 W-22**	**6**
26.	**Weight of 4000 students are found to be normally distributed with mean 50 kgsand standard deviation 5 kgs. Find the number of students with weights** **i) less than 45 kgs** **ii) between 45 and 60 kgs** **(Given : For a standard normal variate z area under the curve between z = 0 and** **z = 1 is 0.3413 and that between z = 0 and z = 2 is 0.4772)**	**W-18**	**6**
27.	**If 2% of the electric bulbs manufactured by company are defective, find the probability that in a sample of 100 bulbs,** **i) 3 bulbs are defective,** **ii) At least two are defective.**	**W-19**	**6**
28.	**In a sample of 1000 cases the mean of certain test is 14 and standard deviationis 2.5. Assuming the distribution to be normal, find** **iii) How many students score above 18?** **iv) How many students score between 12 and 15?** **Given**	**W-19 S-22 W-19**	**6**

<table>
<tr><td></td><td>Frequency 0 to 0.8 = 0.2881
Frequency 0 to 0.4 = 0.1554
Frequency 0 to 1.6 = 0.4452.</td><td></td><td></td></tr>
<tr><td>29.</td><td>In a certain examination 500 students appeared. Mean score is 68 with S.D. 8 Find the number of students scoring
i) Less than 50
ii) Scoring more than 60
Given, Area between $z = 0$ and $z = 2.25$ is 0.4878
Area between $z = 0$ and $z = 1$ is 0.3413</td><td>S-18
W-17
W-18
W-22</td><td>4</td></tr>
<tr><td>30.</td><td>If 30% of the bulbs produced are defective, find the probability that out of 4 bulbs selected
i) One is defective
ii) at the most two are defective</td><td>S-19</td><td>4</td></tr>
<tr><td>31.</td><td>I.Q.'s are normally distributed with mean 100 and standard deviation 15. Find the probability that a randomly selected person has
i) An I.Q more than 130
ii) An I.Q. between 85 and 115.
Given [z = 2, Area = 0.4772 and z = 1, Area = 0.3413]</td><td>W-15,
S-19</td><td>4</td></tr>
<tr><td>32.</td><td>3% of a given lot of manufactured parts are defective. What is the probabilitythat in a sample of 4 items none will be defective?</td><td>S-22</td><td>4</td></tr>
<tr><td>33.</td><td>In a town 10 accidents took place in a period of 50 days. Assuming Poisson distribution, find the probability that there will be 3 or more accidents per day.</td><td>S-22</td><td>4</td></tr>
<tr><td>34.</td><td>The probability of getting an item defective is 0.005. What is the probabilitythat exactly 3 items in a sample of 200 are defective? (Given $e^{-1} = 0.3679$)</td><td>S-22</td><td>4</td></tr>
<tr><td>35.</td><td>Fit a Poisson distribution to set of observations
<table><tr><td>Xi</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Fi</td><td>122</td><td>60</td><td>15</td><td>2</td><td>1</td></tr></table></td><td>S-22</td><td>4</td></tr>
<tr><td>36.</td><td>If 5% of the electric bulbs manufacturing by a company are defective, use Poisson distribution to find the probability that in a sample of 100 bulbs.
i) None is defective
ii) Five bulbs are defective ($e^{-5} = 0.007$)</td><td>W-17</td><td>4</td></tr>
<tr><td>37.</td><td>A problem is given to the three students Ram, Shyam and Amit, whose chances of solving it are ,1/2, 1/3 and 1/4 Respectively. If they attempt to solve a problem independently, Find the probability that the problem is solved by atleast one of them.</td><td>W-17</td><td>4</td></tr>
</table>

38.	**In 200 sets of tosses of 5 fair coins, in how many ways you can expect.** **i) at least two heads** **ii) at the most two heads**	**W-17**	**4**
39.	**The probability that a machine manufactured by a company will be defective 1/10. If 5 such machines are manufactured find probability that.** **i) Exactly two will be defective.** **ii) At least two will be defective.**	**W-18**	**4**
40.	**Fit a Poisson's distribution for the following observations** x_i 0 1 2 3 4 f_i 2 1 7 3 1 1 8	**W-18**	**4**
41.	**A room has 3 electrical lamps. From a collection of 15 electric bulbs of which only 10 are good, 3 are selected at random and put in the lamps. Find the probability that the room is lighted by atleast one of the bulbs.**	**W-19**	**4**
42.	**Fit a Poisson distribution.** x 1 2 3 4 5 f 1 6 1 0 0 2 0 5 2 1	**W-19**	**4**
43.	**The probability that A can shoot at target is 5/7 & B can shoot the same is 3/5,they shoot independently. Find the probability that the target is shot by atleastone of them.**	**W-22**	**4**
44.	**Fit a Poisson distribution for the following data :** x 10 20 30 40 50 f 13 17 12 18 40	**W-22**	**4**
45.	**The probability that a person is a swimmer is $\frac{2}{5}$. What is the probability that out of 4 persons contacted at random, exactly 1 is a swimmer.**	**S-23**	**4**
46.	**On an average 3 of 10 electric component in a pocket are defective. If 4 items are selected at random and tested, what is the probability that not more than one defective?**	**W-08**	**4**
47.	**In 200 sets of tosses of 5 fair coins in how many ways you can expect,** **i) At least two heads (ii) At the most two heads**	**S-08** **W-16**	**4**
48.	**Assuming that the probability of a fatal accident in a factory during the year is 1/1200. Calculate the probability that in a factory employing 300 workers, there will be at least two fatal accidents in a year, given that $e^{-0.25} = 0.7788$**	**W-07** **S-17**	**4**

49.	**If a random variable has poisson distribution such that P(2) = P(3), find P(4) & P(5).**	**S-11 S-23**	**4**
50.	**In a certain factory producing cycles, tyres, there is a small change of 1 in 500 tyres to defective. The tyres are supplied in lots of 10. Using Poisson distribution, find the approximate number of lots of containing: i) No defective ii) One defective iii) Two defective tyres respectively in a consignment of 10,000 lots.**	**S-23 W-23**	**4**

Thank You

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