Unit V

Theoretical Distributions

Section - A

One mark questions:

1. Define a Bernoulli variate. (U)
2. Define a Bernoulli distribution. (U)
3. Write down the probability mass function of a Bernoulli distribution. (K)
4. Write the range of a Bernoulli distribution. (K)
5. Give an example for Bernoulli variate. (U)
6. Write a feature of Bernoulli distribution. (K)
7. Write the parameter of a Bernoulli distribution. (K)
8. Write the mean of a Bernoulli distribution. (K)
9. Write the variance of a Bernoulli distribution. (K)
10. Write the relationship between mean and variance of a Bernoulli distribution. (U)
11. If X_1, X_2, ... X_n are independently identically distributed Bernoulli variates with parameter p, what is the distribution of $X=X_1+X_2+...+X_n$? (K)
12. If $p = \frac{4}{5}$ for a Bernoulli distribution, write down the p.m.f. (K)
13. If $p = \frac{4}{5}$ for a Bernoulli distribution, find variance. (U)
14. Define a binomial vaiate. (U)
15. Define a binomial distribution. (U)
16. Write down the p.m.f. of a binomial distribution. (K)
17. Write down the range of a binomial distribution. (K)
18. Give an example of binomial variate. (U)
19. Write a feature of binomial distribution. (K)

20. What are the parameters of binomial distribution? (K)
21. Write the mean of a binomial distribution. (K)
22. Write the variance of a binomial distribution. (K)
23. Write the relationship between mean and variance of a binomial distribution. (U)
24. Write the recurrence relation for successive probabilities in a binomial distribution. (K)
25. Write the recurrence relation for successive frequencies in a binomial distribution. (K)
26. For what value of 'p' binomial distribution is symmetrical? (K)
27. From the following probability distribution find the value of mode. (U)

x	0	1	2	Total
p(x)	0.25	0.5	0.25	1

28. Define a Poisson variate. (U)
29. Define a Poisson distribution. (U)
30. Write down the p.m.f. of a Poisson distribution. (K)
31. Write the range of a Poisson distribution. (K)
32. Give an example for Poisson variate. (U)
33. Mention a feature of Poisson distribution. (K)
34. What is the parameter of a Poisson distribution? (K)
35. Write the mean of a Poisson distribution. (K)
36. Write the variance of a Poisson distribution. (K)
37. Write the relationship between mean and variance of a Poisson distribution. (U)
38. In which distribution mean and variance are equal? (S)
39. Which type of skewness a Poisson distribution has? (S)
40. Under what condition Poisson distribution tends to normal distribution? (K)
41. In a Poisson distribution if mean is 4, find S.D. (U)
42. In a Poisson distribution if S.D. is 4, find mean. (U)
43. Write the recurrence formula for successive probabilities in a Poisson distribution. (K)
44. Write the recurrence formula for successive frequencies in a Poisson distribution. (K)
45. In a Poisson distribution, if $P(X = 0) = 0.0408$, find λ. (U)
46. Define a hyper geometric variate. (U)
47. Define a hyper geometric distribution. (U)
48. Write down the p.m.f. of a hyper geometric distribution. (K)
49. Write the range of a hyper geometric distribution. (K)
50. Mention a feature of hyper geometric distribution. (K)
51. Write the mean of a hyper geometric distribution. (K)
52. Write the variance of a hyper geometric distribution. (K)
53. Write down the p.m.f. of a hyper geometric distribution whose parameters are a = 4, b = 7 and n = 5. (K)
54. For a hyper geometric distribution the parameters are a = 7, b = 5 and n = 8. Write the range of hyper geometric variate. (K)
55. Given, a = 3, b = 8 and n = 6, find the mean of a hyper geometric distribution. (U)
56. Write down the mean of a hyper geometric distribution whose parameters are a = 4, b = 7 and n = 5. (K)
57. Define a normal variate. (U)

58. Define a normal distribution. (U)
59. Write down the p.d.f. of a normal distribution. (K)
60. Write the range of a normal distribution. (K)
61. Give an example for normal variate. (U)
62. Write the mean of a normal distribution. (K)
63. Write the variance of a normal distribution. (K)
64. What is the value of coefficient of skewness (β_1) for a normal distribution? (K)
65. What is the value of coefficient of kurtosis (β_2) for a normal distribution? (K)
66. What is the probability that a normal variate takes a value greater than its mean? (K)
67. What is the total area under the normal curve? (K)
68. If X is a normal variate with mean μ and S.D. σ, what is the value of P(X < μ)? (K)
69. Write down the area under the normal curve in 1σ neighbourhood of μ. (K)
70. Write down the area under the normal curve in 2σ neighbourhood of μ. (K)
71. Write down the area under the normal curve in 3σ neighbourhood of μ. (K)
72. Define a standard normal variate. (U)
73. Define a standard normal distribution. (U)
74. Write down the p.d.f. of a standard normal distribution. (K)
75. Write the mean of a standard normal distribution. (K)
76. Write the variance of a standard normal distribution. (K)
77. Name the distribution for which variance and S.D. are equal. (K)
78. If Z is a SNV, write the value of P(Z < 0). (K)
79. In a normal distribution, given P(- 0.8 < Z < 0.8) = 0.5762. Find P(0 < Z < 0.8). (U)
80. If Z is a SNV and P(Z > k) = 0.05, find the value of k. (U)
81. If Z is a SNV and P(Z > k) = 0.1, find the value of k. (U)
82. Define a chi-square distribution. (U)
83. Write down the p.d.f. of a chi-square distribution. (K)
84. Write the range of a chi-square distribution. (K)
85. Define degrees of freedom. (U)
86. Mention a feature of chi-square distribution. (K)
87. Write the parameter of a chi-square distribution. (K)
88. Write the mean of a chi-square distribution. (K)
89. Write the variance of a chi-square distribution. (K)
90. If Z is a SNV, then name the distribution of Z^2. (K)
91. If Z_1, Z_2 and Z_3 are three independent standard normal variates, what is the distribution of $Z_1^2+Z_2^2+Z_3^2$? (K)
92. Find mean of a chi-square variate with 8 degrees of freedom. (U)
93. If variance of chi-square variate is 16, what is its mean? (K)
94. Find mode of a chi-square variate with 8 degrees of freedom. (U)
95. For a chi square (χ^2) variate, if $P(0 < \chi^2 < 13.33) = 0.5$, find median. (U)
96. Write down the p.d.f. of a student's t-distribution. (K)
97. Write the range of a student's t-distribution. (K)
98. Write the parameter of a student's t-distribution. (K)

99. Mention a feature of student's t-distribution. (K)
100. Write the mean of a t-distribution. (K)
101. Write the variance of a t-distribution. (K)

Section - B

Two mark questions:

102. Write the mean and variance of a Bernoulli distribution. (K)
103. What is meant by Bernoulli trial? Give an example. (K)
104. Write down the Bernoulli distribution with parameter p = 0.25 (K)
105. Write down the Bernoulli distribution with parameter p = $\frac{2}{5}$. (K)
106. Find the mean and variance of a Bernoulli distribution with parameter p = 0.8. (K)
107. If p = 0.1 for a Bernoulli distribution, find mean and variance. (U)
108. If $p = \frac{1}{2}$ for a Bernoulli distribution, find mean and variance. (U)
109. Find the mean and variance of a Bernoulli distribution with parameter p = 2/3. (U)
110. If $p = \frac{1}{5}$ for a Bernoulli distribution, write down the p.m.f.. Also find variance. (U)
111. Write down the p.m.f. of a Bernoulli distribution with parameter 0.8. Also find S.D. (U)
112. For a Bernoulli distribution, if p = 0.1 write the p.m.f. Also find S.D. (U)
113. If n = 5 and p = 1/4, then write p.m.f. binomial distribution. (K)
114. Write down two features of binomial distribution. (K)
115. Write mean and variance a binomial distribution. (K)
116. 'The mean and variance of a binomial distribution are 4 and 5 respectively'. Comment on this statement with reason. (A)
117. Under which conditions binomial distribution tends to Poisson distribution? (K)
118. Under which conditions binomial distribution tends to normal distribution? (K)
119. In a binomial distribution, if n = 6 and p = 1/3, find mean and variance. (U)
120. For a binomial distribution if n = 5 and p = 0.4, find mean and variance. (U)
121. In a binomial distribution, if n = 6 and p = 1/3, find mean and mode. (U)
122. For a binomial distribution if n = 5 and p = 0.4, find mean and mode. (U)
123. In a binomial distribution, if n = 6 and p = 1/3, find mode and variance. (U)
124. For a binomial distribution if n = 5 and p = 0.4, find mode and variance. (U)
125. In a binomial distribution with 9 trials, the mean is 6. Find 'p' and the variance. (U)
126. In a binomial distribution, if n = 16 and mean = 4. Find p and S.D. (U)
127. If a binomial distribution has mean 3 and variance 2, find the parameters. (U)
128. The mean and S.D. of a binomial distribution are 8 and 2 respectively. Find the parameters. (U)
129. For a binomial distribution, if mean = 4 and S.D. = $\sqrt{2}$, find the parameters. (U)
130. Mention two features of Poisson distribution. (K)
131. Find P(X = 0) in a Poisson distribution with mean 5. (U)
132. The probability that a taxi driver makes no accidents is 0.1353. Find the average number of accidents made by him. (U)

133. In a Poisson distribution if P(X = 0) = 0.1225, write down the p.m.f. (K)
134. In a Poisson distribution if 3×p(3) = p(4). Find mean. (U)
135. In a Poisson distribution, the second probability term is half of the first probability term. Find the variance. (U)
136. In a Poisson distribution the first probability term is 0.3679. Find the next probability term.
137. Mention two features of hyper geometric distribution. (K)
138. Write the parameters of a hyper geometric distribution. (K)
139. Write the mean and variance of a hyper geometric distribution. (K)
140. Given, a = 5, b = 3 and n = 3. Find P(X = 1) for hyper geometric distribution. (U)
141. In a hyper geometric distribution if a = 6, b = 9 and n = 4, find P(X = 2). (U)
142. Find the variance of a hyper geometric distribution with parameters a = 12, b = 8 and n = 6. (U)
143. If a = 5, b = 15 and n = 3, then find the variance of hyper geometric distribution. (U)
144. Given a = 6, b = 4 and n = 4, find the S.D of hyper geometric distribution. (U)
145. For a hyper geometric distribution the parameters are a = 7, b = 5 and n = 8. What is the S.D? (K)
146. Under what conditions hyper geometric distribution tends to binomial distribution? (K)
147. Write the parameters of a normal distribution. (K)
148. Write the mean and variance of a normal distribution. (K)
149. Write the p.d.f. of a normal distribution with mean 3 and S.D. 2 (K)
150. Write the p.d.f. of a normal distribution with mean 10 and S.D. 3 (K)
151. Write the p.d.f. of a normal distribution with mean 55 and variance 4. (K)
152. Consider the following p.d.f. of a normal variate X, $f(X) = \frac{1}{3\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-6}{3}\right)^2}$; $-\infty < x < \infty$. Write the mean and variance of X. (U)
153. The distribution of a variable X is given by, $f(X) = \frac{1}{5\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-100}{5}\right)^2}$; $-\infty < x < \infty$. Write the mean and S.D. (U)
154. What are the values of coefficient of skewness (β_1) and coefficient of kurtosis (β_2) for a normal distribution? (K)
155. The two parameters of a normal distribution are μ = 10 and σ = 5. Find the points of inflexion of the curve. (U)
156. Mean and variance of a normal distribution are 12 and 4 respectively. Find points of inflexion. (U)
157. If the variance of a normal distribution is 9 cm^2., then find Q.D. (U)
158. If the S.D. of a normal distribution is 15, find M.D. (U)
159. In a normal distribution if the values of first and third quartiles are 25 and 55 respectively, find the mean. (U)
160. If the lower and upper quartiles of a normal distribution are 11 and 39 respectively, find the median. (U)
161. If Q_1 = 30 and Q_3 = 70, find the mode of the normal distribution. (U)

162. In a normal distribution mean and variance are 50 and 16 respectively. Find the Q_1 and Q_3. (U)
163. Mean and S.D. of a normal distribution are 20 and 2 respectively. Find lower and upper quartiles. (U)
164. In a normal distribution Q_1 and mean are 40 and 50 respectively. Find the S.D. (U)
165. In a normal distribution mean and Q_3 are 50 and 60 respectively. Find the S.D. (U)
166. In a normal distribution Q_1 and S.D. are 40 and 15 respectively. Find the mean. (U)
167. In a normal distribution Q_3 and S.D. are 60 and 15 respectively. Find the mean. (U)
168. Write the mean and variance of a standard normal distribution. (K)
169. If Z is a SNV and P(Z < k) = 0.95, find the value of k. (U)
170. If Z is a SNV, then name the distribution of Z^2 and write its variance. (U)
171. If Z_1 and Z_2 are two independent SNVs, then name the distribution of $Z_1^2+Z_2^2$ and write its mean. (U)
172. Mention two features of chi-square distribution. (K)
173. Write the mean and variance of a chi-square distribution. (K)
174. What are the mean and variance of chi-square variate with 18 d.f.? (K)
175. Find the S.D. of a chi-square variate with 8 d.f. (U)
176. If variance of a chi-square variate is 16, what are mean and mode? (K)
177. For a chi square $\left(\chi^2\right)$ variate, with 13 d.f. $P\left(0 < \chi^2 < 12.33\right) = 0.5$. Find median and mode. (U)
178. For a chi square $\left(\chi^2\right)$ variate, with 10 d.f. $P\left(0 < \chi^2 < 9.33\right) = 0.5$. Find median and mode. (U)
179. Mention two features of student's t-distribution. (K)
180. Write the mean and variance of a student's t-distribution. (K)
181. If the parameter of t-distribution is 6, find mean and variance. (U)
182. If n = 4 for student's t-distribution, find S.D. (U)
183. If the parameter of t-distribution is 7, find median and variance. (U)
184. If n = 10 for student's t-distribution, find mode and variance. (U)

Section - C

Five mark questions:

185. Mention five features of binomial distribution. (K)
186. Write five features of Poisson distribution. (K)
187. State five properties of a normal distribution. (K)

Section – C/E

Five mark questions:

188. Assuming that birth to male child and birth to female child to be equi-probable, find the probability that a family with three children has 2 or more male children. (U)
189. An unbiased coin is tossed 5 times. Find the probability that the tosses results in i) heads only ii) 3 heads. (U)

190. An unbiased coin is tossed 5 times. Find the probability that the tosses results in i) one head ii) 4 or more heads. (U)
191. The probability that a bomb hits a target is 1/2. Four bombs are aimed at a bridge.3 bombs are enough to destroy the bridge. What is the probability that i) the bridge is destroyed ii) none of the bombs hit the bridge. (U)
192. Team A has probability 0.3 of winning a game. If it plays 5 games, find the probability that it wins i) 4 games ii) at least one game. (U)
193. In a college, 60% of the students are boys. In a random sample of 3 students, calculate the probability of getting i) two boys ii) at least one boy. (A)
194. There are 40 boys and 30 girls in a class. 4 students are selected at random. Find the probability that the selected students are i) all boys ii) at the most two boys. (U)
195. In a college 35% of the students are girls. In a random sample of 5 students, calculate the probability that i) two are girls, ii) at least one is girl. (A)
196. If the chance that a vessel (ship) arrives safely at a port is 9/10. Find the chance that out of 5 vessels, at least 4 will arrive safely. (U)
197. The probability of an arrow hitting a tree is 1/3. If 4 arrows are aimed at the tree, find the probability that i) 3 arrows miss the tree ii) at least two arrows hit the tree. (A)
198. In a certain university, the chance that a professor suffers from dust allergy is 1/5. Calculate the chance that out of 8 professors in a university i) 2 will not suffer from the allergy, ii) at least 2 will suffer from the allergy. (U)
199. In a city 40% of the people are vegetarians. In a random sample of 6 persons find the probability that i) 3 are vegetarians, ii) at least one is vegetarian. (A)
200. The incidence of an occupational disease in an industry is such that the workers have 20% chance of suffering from it. What is the probability that out of 5 workers 4 or more suffer from the disease? (K)
201. The incidence of an occupational disease in an industry is such that the workers have 20% chance of suffering from it. What is the probability that out of 5 workers at most 1 suffer from the disease? (K)
202. There are 100 wrist watches in a box. 5 of them are defective. In a selection of 6 watches, what is the probability of getting less than 2 defective wrist watches? If there are 50 such boxes, in how many of them will you find 2 defective wrist watches? (K)
203. In a grove there are 200 trees. Out of which 50 are mango trees. Among them, if 20 samples of 3 trees each are selected, in how many samples will you expect i) exactly one mango tree ii) more than one mango tree? (K)
204. In a village 1/3 of the people are literates. If 100 investigators meet 5 persons each to see if they are literates, then how many investigators would you expect to report that 2 or more are literates? (K)
205. In a certain school 40% of the students have opted for first language Kannada. Assuming 20 teachers take a sample of 4 students each, how many teachers will report that 2 or 3 students opted for first language Kannada? (K)
206. Four unbiased coins are tossed 64 times. Find expected frequencies of number of heads obtained. (U)

207. Four unbiased coins are tossed 128 times. Find the theoretical frequencies for the number of heads obtained. (U)

208. Five unbiased coins are tossed 128 times. Calculate the expected frequencies for the number of heads obtained. (A)

209. Five unbiased coins are tossed 256 times. Find the theoretical frequencies for the number of tails obtained. (U)

210. Six unbiased coins are tossed 256 times. Calculate the expected frequencies for the number of heads obtained. (A)

211. Fit a binomial distribution to the following data and obtain the theoretical frequencies. (A)

Number of defective balloons	0	1	2	3	4
Number of packets	6	12	22	24	16

212. Fit a binomial distribution to the following data and obtain the expected frequencies. (A)

Male births	0	1	2	3	4
No. of families	46	194	270	230	60

213. Four coins are tossed 100 times and the following distribution is obtained.

Number of heads	0	1	2	3	4
Number of tosses	8	32	33	22	5

Fit a binomial distribution when nature of the coin is not known. Obtain the theoretical frequencies. (A)

214. Five coins are tossed 256 times and the following distribution is obtained.

Number of heads	0	1	2	3	4	5
Number of tosses	35	39	45	62	50	25

Fit a binomial distribution when nature of the coin is not known. Obtain the theoretical frequencies. (A)

215. For the following data, fit a binomial distribution and obtain the expected frequencies. (A)

Number of defective screws	0	1	2	3	4
Number of samples	3	20	26	17	9

216. The following data relates to the number of defective items.

Number of defective items	0	1	2	3	4	5
Number of samples	171	200	99	20	8	2

Fit a binomial distribution to the data. Obtain the theoretical frequencies. (A)

217. In a binomial distribution with parameters n = 3 and p, the second and the third frequency terms are 26 and 24 respectively. Find p (U)

218. A typist makes 2mistakes per page on an average. Find the probability that a page typed by him has i) 2 mistakes ii) at the most 2 mistakes. (U)

219. On an average, a telephone operator receives 3 telephone calls per 5 minutes interval. Calculate the probability that in a particular 5 minutes interval he i) does not receive any call ii) receives more than one call. (A)

220. On an average a box contains 2 defective items. Find the probability that a randomly selected box has i) no defective item ii) at least two defective items. (U)
221. It has been found that on an average 4 patients visit a particular doctor during one hour. What is the probability that during a particular hour i) doctor is free ii) more than 3 patients visit the doctor? (K)
222. A car hire agency has two cars. On an average there is a demand for one car during a particular hour. What is the probability that i) both the cars are free ii) some demand is refused? (K)
223. If 2% of electric bulbs manufactured by a company are known to be defective, what is the probability that a sample of 150 electric bulbs taken from the production process of that company would contain i) exactly one defective bulb? ii) more than two defective bulbs? (Use Poisson approximation). (K)
224. A 200 pages book has 0.4 mistakes per page on an average. i) Find the probability that a randomly selected page from the book is free from mistakes ii) in the book how many pages contain mistakes? (U)
225. In a text book, on an average 0.3 mistakes per page is found. If there are 500 pages in the text book, in how many pages will there be i) three mistakes ii) at the most two mistakes? (K)
226. On an average, the number of defective items in a box is 4. If there are 100 such boxes, in how many of them would you expect i) one defective item ii) at least 2 defective items? (K)
227. The number of accidents in a year attributed to taxi drivers in a city follows Poisson distribution with mean 2.5. Out of 1000 taxi drivers, find approximate number of drivers with i) one accident in a year ii) more than three accidents in a year. (U)
228. On an average, one in every 50 valves manufactured by a firm is substandard. If valves are supplied in packets of 100 each, in how many of the lot of 2000 packets would you expect substandard valves? (Use Poisson approximation). (K)
229. The probability that a knife manufactured by a firm is defective is 1/50. Knives are supplied in boxes of 50 each. In a lot of 1000 boxes, how many boxes contain i) 3 defective knives ii) at least one defective knife? (Use Poisson approximation). (K)
230. Out of experience, it is known that 1% of the screws manufactured by a firm are defective. Screws are supplied in packets of 100 each. What is the probability that a randomly selected packet has 2 defective screws? Among 3000 packets, in how many packets would you expect defective screws? (Use Poisson approximation). (K)
231. The probability of a fuse manufactured by a firm found to be defective is 0.05. Find the probability that a box containing 100 fuses have no defective fuse. Among 500 such boxes how many contain exactly 4 defective fuses? (Use Poisson approximation). (U)
232. In a certain factory turning out optical lenses there is a chance 1/500 for lens to be defective. The lenses are supplied in packets of 50 each. Use Poisson distribution to calculate the approximate number of packets containing one defective lens in a consignment of 20000 packets. (A)
233. If a random variable X follows Poisson distribution such that P(X=1) = P(X = 2), find i) mean ii) standard deviation and iii) the first probability term. (U)

234. In a Poisson distribution, P(X = 2) = P(X = 3). Find P(X = 4). (U)

235. In a Poisson distribution, if first two frequencies are 100 and 120 respectively. Find next two frequencies. (U)

236. In a Poisson distribution, the second and third frequencies are 120 and 60 respectively. Find next two frequencies. (U)

237. The following are mistakes per page observed in a book.

Number of mistakes per page	0	1	2	3	4 and more
Number of pages	68	37	10	5	0

Fit a Poisson distribution to the data. Obtain expected frequencies. (A)

238. Fit a Poisson distribution to the following data and hence find the theoretical frequencies. (A)

No. of deaths per day	0	1	2	3	4 and more
No. of days	20	45	30	5	0

239. Fit a Poisson distribution to the following data and hence find the theoretical frequencies. (A)

No. of T.V. Sets sold	0	1	2	3	4	5 and more
No. of days	31	34	21	12	2	0

240. Fit a Poisson distribution to the following data and hence find the theoretical frequencies. (A)

X	0	1	2	3	4	5
f	46	29	12	7	4	2

241. A bag contains 10 red and 5 black marbles. A random sample of 5 marbles is taken. Find the probability that the sample contains 3 red marbles. Also find the mean of red marbles. (U)

242. There are 14 fruits in a basket, out of which 8 are mangoes and rests are oranges. A girl picks 5 fruits at random from the basket. Find the probability that she gets 3 mangoes. Also find the mean of mangoes. (U)

243. A student preparing for an examination studies only 10 out of 12 sections prescribed. If the teacher selects 8 sections at random, what is the probability that the student will have studied i) six and ii) five of these sections? (K)

244. There are 15 lecturers in a college. Out of them 8, belong to the science faculty. The college management builds 5 residential quarters and allots them to 5 randomly selected lecturers. Find the probability that i) all the quarters are allotted to science lecturers.
ii) three quarters are allotted to science lecturers. (U)

245. A pond has 10 fishes among which 4 are marked (marked fishes are under scientific observation). 4 fishes are caught from the pond. Find the probability that two of them are marked. Also find the mean of marked fishes. (U)

246. A basket has 10 mangoes, out of which 6 are ripe. 3 mangoes are randomly selected.
i) What is the probability that all the picked mangoes are ripe?
ii) Find the expected number of ripe mangoes among the picked ones. (U)

247. In a normal distribution, $Q_1 = 40$ and $Q_3 = 60$. Find mean, Q.D. and S.D. (U)

248. In a normal distribution, mean and S.D. are 50 and 15 respectively. Find Q_1, Q_2 and Q_3. (U)

249. If X is a normal variate with mean 64 and S.D. 4, find the probability that i) $X \geq 68$
ii) $60 \leq X < 68$ (U)

250. If X is a normal variate with mean 64 and S.D. 4, find the probability that i) X < 62 ii) $60 \leq X < 66$. (U)
251. If X is a normal variate with mean 64 and variance 4, find the probability that i) X $\geq$ 60 ii) X < 66. (U)
252. If X ~ N(50, 3^2), find the probability that the value of the variate X is i) more than 47, ii) lies between 44 and 53. (U)
253. Marks scored by the students of a class follow normal distribution with mean 80 and S.D. 5. Calculate the probability that a student selected at random from the class scored i) more than 90 marks ii) between 70 and 85 marks. (A)
254. Marks scored by the students of a class follow normal distribution with mean 80 and S.D. 5. Find the probability that a student selected at random from the class scored i) more than 70 marks ii) between 75 and 90 marks. (U)
255. Monthly income of employees follows normal distribution with mean Rs.18,000 and S.D. Rs.800. Compute the probability of employees with monthly income i) more than Rs.20,000 ii) lies between Rs.16,000 and Rs.17,000. (A)
256. The weekly wages of workers are normally distributed with mean Rs.3000 and S.D. Rs.500. Calculate the probability of workers whose weekly wages will be i) more than Rs.3400 ii) between Rs.2500 and Rs.3500. (A)
257. The weekly wages of workers are normally distributed with mean Rs.3000 and S.D. Rs.500. Find the probability of workers whose weekly wages will be i) more than Rs.2500 ii) between Rs.2600 and Rs.3200. (U)
258. The mean I.Q. of a large number of children of age fourteen is 95 and the S.D. is 5. Assuming that I.Q. follows normal distribution, find the i) percentage of the children with I.Q. under 85. ii) proportion of the children with I.Q. above 90. (S)
259. The weights of 1000 students are normally distributed with mean 55 kg and S.D. 2 kg. Calculate the number of students with weight between 57 kg and 60 kg. (A)
260. Heights of 2000 soldiers are normally distributed with mean 175 cm and variance 16 cm^2. Find the number of soldiers with height between 173 cm and 177 cm. (U)
261. Heights of 360 children are normally distributed with mean 120 cm. and variance 4 cm^2. Find the number of children having height i) greater than 118 cm. ii) less than 124 cm. (A)
262. The weights of 1000 youths are normally distributed with mean 60 kg and S.D. 4 kg. Find the number of youths with weight i) more than 56 kg. ii) less than 68 kg. (U)
263. The weights of 500 persons are normally distributed with mean 60 kg and S.D. 5 kg. Find the number of persons with weight between 62 kg and 70 kg. (U)
264. The weights of 500 persons are normally distributed with mean 60 kg and S.D. 5kg. Find the number of persons with weight i) more than 68 kg ii) less than 55 kg. (U)
265. Height of a group of 500 candidates who attended the army selection camp is normally distributed with mean 170cm and S.D. 5cm. Minimum eligible height for army selection is 175cm.How many candidates from above group are eligible? (S)
266. Height of a group of candidates who attended the army selection camp is normally distributed with mean 170cm and S.D. 3.9cm. Minimum eligible height for army selection is 175cm. Show that 10% of the above group is eligible. (S)
267. The daily wages of workers are normally distributed with mean Rs.500 and S.D. Rs.50. i) Find the probability of workers whose daily wages will be between Rs.400 and Rs.600 ii) Show that only 10% of workers have daily wages more than Rs.564. (S)