Section 1

Choose any one question from A and B

Question A

The XYZ Pizza hut is known for its tasty and quality Pizzas. There is a great demand for its Pizzas by the customers. The following data relates to the distribution of Pizza delivery time (minutes) for 20 customers by a Pizza delivery boy.
22 23 25 26 28 29 30 33 40 47
41 34 33 32 30 29 28 25 24 21
Assume that the delivery time is normally distributed.
(a) Find the population mean and population SD
(b) What is the probability that for a randomly selected customer will receives the Pizza at at least 43 minutes.
(c) What is the probability that for a randomly selected customer will receives the Pizza at most 37 minutes.
(d) What is the probability that for a randomly selected customer will receives the Pizza between 43 and 48 minutes.

OR

Question B

KIMS is a 1000 bedded general hospital with a trauma care centre. The following data relates to the duration of hospitalization of patients depending on their disease condition.
2 3 1 19 5 7 21 8 45 10
24 6 90 9 17 49 1 5 52 60

As a data analyst you are requested by the hospital authority to help them in finding the summary statistics of the duration of hospitalization. Also, they wish to know which are the best measures to describe the above data?

Section 2

Choose any one question from C and D

Question C

A company manufactures impellers for use in jet-turbine engines. One of the operations involves grinding a particular surface finish of a titanium alloy component. Two different grinding processes can be used and both processes can produce parts at identical mean surface roughness. The manufacturing engineer would like to select the process having the least variability in surface roughness. A random sample of n1=12 parts from the first process results in a sample mean of 25.58 microinches with a standard deviation of S1 = 5.1 microinches and the second process from n2=15 parts results in mean of 22.31 microinches with a standard deviation of S2= 4.7 microinches. Test whether the grinding process 2 has lower surface roughness compared to grinding process 1 at
(i) 1% level of significance (Critical value is 1.701)
(ii) 5% level of significance (Critical value is 2.467)
(iii) What difference do you find between the above two levels of significance?
(iv) Is there a need for P-value in such a case? If so what would be the approximate P-value for this problem
(v) Find a 95% and 99% confidence interval for difference in population means.
(vi) Interpret your results taking into consideration the Null hypothesis, Confidence interval and P-value.

OR

Question D

In a clinical trial the researchers were intended to measure the effectiveness of three drugs on Iron intake (mg) among 10 pregnant women in each group. They wish to find out whether this data is sufficient to conclude that there is significant difference in mean iron intake among all three drugs.
Drug I 11.5 19.5 18.5 12.5 18.5 16.5 26.5 18.5 16.0 24.5
Drug II 27.0 28.0 22.0 21.0 15.0 19.5 20.0 26.0 30.0 28.5
Drug III 28.0 30.0 26.0 30.0 24.5 28.5 26.0 30.0 27.0 25.5
Does this data suggest a significant difference in the mean iron intake for all three drugs at 5% level of significance?