PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 2022
(Sixth Semester)
Branch – STATISTICS

INDUSTRIAL STATISTICS

Time: Three Hours   Maximum: 75 Marks

SECTION-A (10 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (10 x 1 = 10)

1   Variation in the items produced in a factory may be due to;
(i)   assignable causes   (ii) chance factors
(iii) both (a) and (b)   (iv) None of these

2   The faults due to assignable causes
(i)   Can be removed   (ii) cannot be removed
(iii) can sometimes be removed   (iv) All the above

3   Shewhart's control chars are meant
(i)   to deduct whether the process is under statistical quality control
(ii) to find the assignable causes
(iii) to reflect the selection of samples
(iv) All the above

4   Trial control limits for mean with usal notations are_____
(i) $U.C.L = \bar{X} + A_1 \bar{S}$, $C.L = \bar{X}$, $L.C.L = \bar{X} - A_1 \bar{S}$
(ii) $U.C.L = \bar{X} + A_1 \bar{S}$, $C.L = A_1 \bar{S}$, $L.C.L = \bar{X} - A_1 \bar{S}$
(iii) $U.C.L = \bar{X} + A_1 \bar{S}$, $C.L = A_1 \bar{S}$, $L.C.L = \bar{X} + A_2 \bar{S}$
(iv) None of the above

5   The expected sample size required to arrive at a decision about the lot is called____
(i)   a random variable   (ii) Average Sample Number
(iii) power curve   (iv) None of the above

6   The probability of rejecting a lot having $\bar{p}$ as the process average defectives is known as
(i)   consumer's risk   (ii) producer's risk
(iii) Type II error   (iv) All the above

7   Accepting sampling plans are preferable due to _____
(i)   the economy in inspection   (ii) protection to perishable items
(iii) increased efficiency in the inspection of items (iv) All the above

8   The decision about the acceptance or rejection of a lot by variables is _____
(i)   less reliable than by attributes (ii) more reliable than by attributes
(iii) not feasible   (iv) All the above

9   What is the failure cost of a product possessing reliability R=1?
(i)   Zero   (ii) Unity
(iii) Infinity   (iv) None of the above

10 Which among the following exhibits inversely proportional relationship with the reliability?
(i)   Production cost   (ii) Design and development cost
(iii) Maintenance and repair cost (iv) All of the above

SECTION - B (35 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks (5 x 7 = 35)

11 a   Write short notes an assignable causes and chance factors.

OR

   b   Briefly outline the concept of process and product control.

12 a   Discuss the behaviour of $\bar{X}$ chart in relation to R charts.

OR

   b   Describe the important steps for the construction p and np charts.

13 a   Explain an average outgoing quality limit.

OR

   b   Explain the procedure of single sampling plan with flow chart.

14 a   Give the advantage and disadvantages of accepting sampling plan for variables.

OR

   b   Explain the concept of Normal Reduced and Tightened plans.

15 a   Briefly explain hazard failure rate.

OR

   b   Explain the meaning of MTTF (Mean Time to Failure).

SECTION - C (30 Marks)
Answer any THREE Questions
ALL Questions Carry EQUAL Marks (3 x 10 = 30)

16   Bring out the benefits of statistical quality control.

17   A machine is set to deliver the packages of a given weight. Ten samples of size five each were examined and the following results were obtained.

Sample No	1	2	3	4	5	6	7	8	9	10
Mean	43	49	37	44	45	37	51	46	43	47
Range	5	6	5	7	7	4	8	6	4	6

Calculate the values for the central line and the control limits for the mean chart and range chart. Comment on the state of control.

18   Briefly explain the OC curve of sequential sampling plan.

19   Derive that n and k for known σ plans.

20   Briefly explain the concept of mean time between failure rate.

Z-Z-Z   END