

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 140654

Roll No.

B.TECH.

Theory Examination (Semester-VI) 2015-16

RELIABILITY ENGINEERING

Time : 3 Hours

Max. Marks : 100

Section-A

1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (10×2=20)

- (a) What do you mean by useful life of a component?
- (b) How does human error affect the system reliability?
- (c) List any two functions of reliability analyst in an organisation.
- (d) Define random event.
- (e) Define reliability testing.

- (f) Define redundancy
- (g) Define data analysis.
- (h) Give the importance of reliability.
- (i) What do you mean by failure? Define it.
- (j) What is meant by random failure?

Section-B

2. Attempt any five parts of the following. (10×5=50)

- (a) A satellite is to be launched into space (event A) from where it has to take a photograph of the earth and transmit it to the earth station (Event B). If the probability of successful launching is 0.98, and the probability that all subsystems of the satellite work properly in the orbit, is 0.92, Calculate:
 - (i) The probability that the earth station will receive the photograph.
 - (ii) The probability that the earth station will not receive the photograph.
- (b) The mean time to failure of a particular type of com-

- ponent is 800 h. What is the probability that a similar component will fail in an operating time of (a) 200 h (b) 400 h (c) 800 h (d) 1000 h.
- (c) Define redundancy. Explain in detail unit redundancy and component redundancy.
- (d) Define reliability testing & life testing along with the requirements and methods.
- (e) What are logic diagrams? Explain the cut set and tie set methods.
- (f) Explain in detail the methods of reliability improvement.
- (g) What do you know about data reporting system? Explain data reduction & analysis.
- (h) Derive reliability function using markov model.

Section-C

Note: Attempt any two parts of the following. (15×2=30)

3. Define reliability. What are the factors affecting reliability? Explain in detail the various parameters of system effectiveness.

4. Comparing component redundancy and unit redundancy, whose yield will be higher? Explain. List the various methods of reliability improvement & explain these in detail.
5. What is the effect of maintenance on reliability? Discuss in detail what are the methods of reliability improvement?

