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1 90 '-----
2 100 'POISSON REDUNDANT RELIABILITY OF OPERATING UNITS (POISSONO.BAS)
3 110 '-----
4 160 CLS
5 170 Print
6 180 Print " POISSON REDUNDANT RELIABILITY OF OPERATING UNITS (POISSONO.BAS)"
7 182 Print " ORIGINAL DATE: Circa 1985"
8 184 Print " REVISION DATE: October 24, 2020"
9 186 Print " AUTHOR: Phil Rutherford"
10 188 Print " RUN DATE: ";Date$;
11 190 Print " (DD-MM-YYYY)
12 192 Print " RUN TIME: ";TIME$
13 194 Print " RUN WITH MMBASIC.EXE (www.mmbasic.com)"
14 196 Print
15 230 Print " APPLICABLE TO HEAT PIPE PROBLEMS WHERE M+N UNITS ARE OPERATING IN PARALLEL"
16 240 Print " MU=(M+N)*LAMDA*T"
17 250 Print
18 260 Input " MINIMUM NUMBER OF OPERATING UNITS REQUIRED (M) ";M
19 300 Input " MAXIMUM NUMBER OF EXCESS (SPARE) OPERATING UNITS (N) ";NMAX
20 400 Input " UNIT FAILURE RATE (PER HOUR) ";LAMDA
21 500 Input " MISSION TIME (HOURS) ";T
22 510 Print
23 520 Dim FAC(100)
24 750 RNOFAIL=Exp(-1*M*LAMDA*T)
25 800 Print " RELIABILITY WITH 0 SPARES IS ";RNOFAIL;TAB(48);"P(=>";M;"/";M;".S)"
26 870 '-----
27 900 'FACTORIAL
28 910 '-----
29 1000 FAC(0)=1
30 1100 For J=1 To NMAX
31 1200 FAC(J)=FAC(J-1)*J
32 1250 Next J
33 1300 For N=1 To NMAX
34 1350 RNOFAIL=Exp(-1*(M+N)*LAMDA*T)
35 1390 SERIES=0
36 1400 For NN=0 To N
37 1410 X=(M+N)*LAMDA*T
38 1420 Y=NN*Log(X)-Log(FAC(NN))
39 1450 SERIES=SERIES+Exp(Y)
40 1460 Next NN
41 1500 R=RNOFAIL*SERIES
42 2000 Print " RELIABILITY WITH";N;" SPARES IS ";R;TAB(48);"P(=>";M;"/";M+N;".S)"
43 2100 Next N
44 2200 End

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