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Courses » Satellite Communication

Announcements

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## Unit 3 - Week 2

### Course outline

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#### Week 2

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## Assignment-2

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

Due on 2017-09-06, 23:59 IST

### Instructions

- i. Multiple choices of each questions are marked as A to D. Only one is unambiguously correct. Choose the most appropriate one.
- ii. Assume spherical earth with average radius of 6378 Km

1) A solar panel of a satellite is filled with 50000 solar cells of 8 sq-cm each. If 12% of the total area is reserved for wiring, then calculate the area of the solar panel. 5 points

- A. 55.5 sq-meter
- B. 50 sq-meter
- C. 45.5 sq-meter
- D. 40 sq-meter

No, the answer is incorrect.

Score: 0

Accepted Answers:

C. 45.5 sq-meter

2) Two systems of reliability 0.8 and 0.9 are connected in series. The overall reliability of the integrated system will be 5 points

- A. 0.72
- B. 0.85
- C. 0.9
- D. 0.98

No, the answer is incorrect.

Score: 0

Accepted Answers:

A. 0.72

3) Determine the power received by a VSAT terminal with effective antenna aperture area of 0.098 sq-meter. The receiver terminal is 40000Km away from the transmitter and the transmitter transmits 20 KW power. 5 points

- A. -100 dBw
- B. -100.1 dBm
- C. -130 dBm
- D. none of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

B. -100.1 dBm

- 4) Telemetry system of the satellite samples in sequence 40 sensors each producing 20 bits, adds 240 bits overhead to form a frame and transmits the data at 1 Kbps to Control Earth Station 42,000 km away. How long does it take to receive a complete telemetry data frame at control earth station after the last bit of the frame is transmitted by the telemetry?

5 points

- A. 1.04 sec  
 B. 1.18 sec  
 C. 0.14 sec  
 D. 2 sec

No, the answer is incorrect.

Score: 0

Accepted Answers:

- B. 1.18 sec

- 5) A satellite antenna makes 3-dB angle of  $5^\circ$  to cover a specific region of the earth. Assuming 80% antenna efficiency, determine the gain of the antenna at 10 GHz.

5 points

- A. 48.7 dBi  
 B. 20.6 dBi  
 C. 32.5 dBi  
 D. 42.5 dBi

No, the answer is incorrect.

Score: 0

Accepted Answers:

- C. 32.5 dBi

- 6) Find number of cells required to generate end of life power of 5000 Watts. Assume, solar flux of 1100 Watts/sq-meter, solar cell efficiency at EOL of 10%, loss due to shielding is 28% and cell area is 8 sq-cm.

5 points

- A. 78000  
 B. 87345  
 C. 78121  
 D. 78915

No, the answer is incorrect.

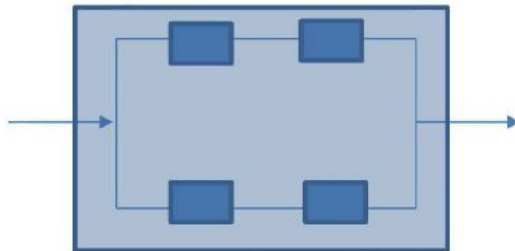
Score: 0

Accepted Answers:

- D. 78915

- 7) A box consists of four identical components of equal reliability of 0.8 are connected as shown in the figure below. Determine the reliability of the entire box.

5 points



- A. 0.87  
 B. 0.74  
 C. 0.93  
 D. 0.80

No, the answer is incorrect.

Score: 0

Accepted Answers:

- A. 0.87

- 8) For an interplanetary mission the spacecraft receives tele-command consisting of header and command word at 100 bps. If the system is designed to accept header with up to two errors, then determine the minimum header length for false alarm probability of once in 400 days.

5 points

- A. 40
- B. 42
- C. 44
- D. 46

No, the answer is incorrect.

Score: 0

Accepted Answers:

B. 42

- 9) For EOL DC power of 6 KW, 80% of the DC power is used by transponders. Each of the transponders has DC to RF conversion efficiency of 25% and transmits 20 dBw RF power. Find the number of transponders

- A. 10
- B. 11
- C. 12
- D. 13

No, the answer is incorrect.

Score: 0

Accepted Answers:

C. 12

- 10) For the longest duration of eclipse of 72 minutes, the power required to be supplied to the satellite is 4 KW. Each of the batteries has capacity of 93 Watt-hours, depth of discharge of 80% with discharge efficiency of 95%. If the mean discharge voltage is measured as 1.3 volts, determine the number of battery cells are required.

- A. 50
- B. 51
- C. 52
- D. 53

No, the answer is incorrect.

Score: 0

Accepted Answers:

D. 53

You were allowed to submit this assignment only once.



5 points



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