Welcome to the

NIFA 2004 Regional SAFECON

Manual Flight Computer Test

NAME _____

CONTESTANT NUMBER _____

SCHOOL _____

INSTRUCTIONS: **You will be given fifty (50) minutes to complete the following test. The test is made up of thirty five (35) multiple-choice and five (5) fill-in questions. Electronic calculators, electronic computers, instructional manuals, are not allowed. No aids of any type may be marked, taped, or glued to your manual flight computer.**

Mark you answers on the answer sheet provided by filling in the circle provided. Only the answer sheet will be graded. In case of ties, faster completion time takes precedence.

Write the serial number of this test packet (located at the top of this envelope) on your answer sheet in the space provided.

DO NOT OPEN THIS ENVELOPE UNTIL TOLD TO DO SO!

1. Tim is flying from General Mitchell International (MKE) in Milwaukee, WI to Kalamazoo/Battle Creek Regional (AZO) in Battle Creek, MI a distance of 281 nautical miles. His indicated airspeed is 142 knots at 7500 ft pressure altitude, on a true course of 094°, with the winds aloft of 160° at 25 knots. If Tim's altimeter setting is 29.99" and the OAT is 15°C, what is Tim's groundspeed?

   A. 151 knots
   B. 130 knots
   C. 241 km/hr
   D. 205 mph

2. Use information from problem 1. Tim decides to over-fly AZO and return to MKE. If the winds aloft switch to 115° at 15 knots, giving him a groundspeed of 325 km/hr, what is the total flight time for the entire trip?

   A. 163 minutes
   B. 177 minutes
   C. 191 minutes
   D. 207 minutes

3. Use information from problems 1 and 2. If the aircraft burns 46.7 liters/hr and there is 52 Imperial Gallons on board, can the aircraft depart MKE, go to and over-fly AZO, return to MKE, and have one hour of reserve fuel?

   A. Yes, he'll have 22 minutes extra on top of the hour of reserve fuel
   B. Yes, he'll have 37 minutes extra on top of the hour of reserve fuel
   C. Yes, he'll have one hour extra on top of the hour of reserve fuel
   D. No, he'll have to consume some of his reserve fuel

4. You are traveling in a standard atmosphere at 7500 feet on a true course of 147°. The wind correction angle is 7°L and the groundspeed is 146 knots. If the winds aloft are 080° at 20 knots, what is your indicated airspeed?

   A. 122.5 mph
   B. 141 mph
   C. 162 mph
   D. 261 km/hr

5. Departing from an airport (elevation 99 feet), you are to cross over a ridge (elevation 2400 feet) by 500 feet. If your groundspeed is 112 knots and you maintain a 800 feet/minute climb, how far from the ridge are you when you liftoff?

   A. 4.44 nautical miles
   B. 5.12 nautical miles
   C. 5.90 nautical miles
   D. 6.55 nautical miles

6. Jim is going to operate an aircraft that weighs 2450 pounds with a CG of 87.4 inches. If Jim adds 140 kg of bags to station 120, what is the new CG?

   A. 87.8 inches
   B. 89.9 inches
   C. 91.1 inches
   D. 92.5 inches

7. Jeff wants to take Jane, who says, “I weigh the equivalent of 19 US gallons of Avgas” and her luggage (20 kg), Jill (125 lbs) and her luggage (20 lbs), and Jennifer (57 kg) with no luggage to Vegas. Jeff’s aircraft, with him, the aircraft, and fuel, weighs 970 kg. If the max ramp and takeoff weight is 2560 lbs, can you take every one?

A. No, overweight by 7.2 pounds
B. No, overweight by 25 pounds
C. Yes, underweight by 97.6 pounds
D. Yes, underweight by 52.1 pounds

8. Using information from question 7. Jeff switches to a new aircraft. The load and the aircraft weights are the same. However, the max ramp weight is 2650 lbs. How much extra fuel can Jeff take to attain the new max ramp weight?

A. 52.2 liters
B. 45.9 liters
C. 39.4 liters
D. 31.1 liters

9. After traveling 42.7 statute miles, Tina notices she is 9.1 kilometers right of course. If she has 101.1 nautical miles until her arrival point and her current true heading is 101°, what must Tina turn her true heading to in order to re-intercept her original course 20 nautical miles prior to her arrival point?

A. 98.5°
B. 89.5°
C. 95.5°
D. 92.5°

10. JoAnn is 4° right of course after 42 minutes and 30 seconds into her flight. If JoAnn’s roundspeed is 126 mph, how many nautical miles is she off course by?

A. 5.2 nautical miles
B. 4.7 nautical miles
C. 3.8 nautical miles
D. 3.1 nautical miles

11. Julie crosses a ridge (elevation 6540 feet) at an indicated altitude of 11,500 feet. The temperature is +5°C and the altimeter setting is 29.22”, what is her true altitude?

A. 10 750 feet
B. 11 250 feet
C. 11 780 feet
D. 12 660 feet

12. You are flying from Austin, TX to San Antonio, TX (213 nautical miles). You only want to burn 36 U.S. Gallons of Avgas to and from San Antonio. The fuel burn rates and groundspeed are as follows:

Altitude	Fuel Burn	Groundspeed Out	Groundspeed Back
4500 feet	12.9 US gph	126 knots to	126 knots return
6500 feet	11.8 US gph	119 knots to	119 knots return
8500 feet	10.7 US gph	123 knots to	123 knots return
10500 feet	9.4 US gph	97 knots to	141 knots return

Which altitude will give you the desired result?

A. All the altitudes will work
B. 8500 feet and 10500 feet will work
C. None of the altitudes will work
D. 10500 feet only

13. At a climb rate of 400 feet per statute mile or 1300 feet per minute, what is your groundspeed?

A. 195 knots
B. 187 knots
C. 178 knots
D. 169 knots

14. You find yourself .28" aft of CG. You decide to move some bags from the aft bag compartment, station 131" to the rear seat, station 95". How much weight will you have to move if the aircraft weighs 5167 lbs?

A. 41 lbs
B. 44 lbs
C. 37 lbs
D. 35 lbs

15. Your current CG is 193.5 cm. The forward CG limit is 195 cm. If your aircraft weighs 1409 kg, how much weight will you need to remove from station 230 cm in order to you within CG?

A. 63 kg
B. 60 kg
C. 57 kg
D. 55 kg

16. Your aircraft currently weighs 2140 kg and your CG is 92.1". If you add 22 kg to station 74" what will be your new CG?

A. 92.3
B. 91.7
C. 91.9
D. 92.5

17. You're 2.3 inches forward of your forward CG limit of 83 inches. You decide to remove 34 lbs from station 59 in order to bring you within CG. What is your new weight?

A. 311 lbs
B. 321 lbs
C. 339 lbs
D. 355 lbs

18. You need to move your CG back .34". Your aircraft weighs 2412 lbs and you decide to move 33 lbs from station 78". Where will you end up putting that 33 lbs?

A. Station 24
B. Station 57
C. Station 81
D. Station 103

19. You've decided to live on the edge and fly an out and back course landing at your departure airport without any fuel left. Currently there is forty three gallons of fuel in your tanks, you burn 8.3 GPH, and there is a low-level jet out of the southeast at forty five knots. TAS = 103 and True Course is 083. How far out do you go before turning back?

A. 245 nm
B. 249 nm
C. 253 nm
D. 257 nm

20. What is the headwind component for takeoff given the following info. Rwy 03 (030°), METAR winds of 090°True @ 14 knots, elevation 2992 ft, and variation 13W.

A. 0
B. 2
C. 4
D. 6

21. In reference to #20, what's the crosswind component?

A. 7
B. 9
C. 11
D. 14

22. In reference to #20, where would the nose be pointing during initial climb if you tracked runway heading. Note: TAS = 70 kts.

A. 041
B. 044
C. 047
D. 050

23. If you depart a runway at 4500 ft MSL that is 3800 ft long, what is your TAS at rotation if you indicate 63 kts when you pull back on the stick? Altimeter setting is 30.34 and the temp is 64F.

A. 66
B. 68
C. 70
D. 72

24. 876540 seconds is the same as:

A. 365 days
B. 14690 minutes
C. 23 hours 45 minutes
D. 10 days 3 hours 29 minutes

25. If the field elevation at KAVL is 2165', the current temperature is 80°F and the altimeter setting is 29.67, what is the density altitude?

A. 1933'
B. 2398'
C. 3693'
D. 4260'

26. What is the % mean aerodynamic chord (%MAC) if the leading edge mean aerodynamic chord (LEMAC) is 150.5, the center of gravity (CG) is 180.0 and the mean aerodynamic chord (MAC) is 115.2?

A. 76.5%
B. 43.1%
C. 25.6%
D. 19.6%

27. In cruise flight at Flight Level 220, the outside air temperature is -22°C, if you are cruising at 0.545 Mach, how long will it take to fly 437 sm (assuming no winds)?

A. 35:06
B. 1:07:40
C. 1:18:05
D. 1:54:44

28. What is the true airspeed if you are cruising at 8500', with an indicated airspeed of 115kts, an outside air temperature of 50°F and an altimeter setting of 30.33?

A. 132 kts
B. 136 kts
C. 142 kts
D. 154 kts

29. You are inbound on the CLT 315° radial with a TAS of 102 mph. What is the winds aloft if you have a groundspeed of 124mph and are holding 7° right correction?

A. 106°@23 kts
B. 163°@26 kts
C. 286°@23 kts
D. 343°@26 kts

30. Maximum operating airspeed (Vmo) for the de Havilland DHC-8-201 at 14000' is 242 kts. Maximum operating airspeed (Vmo) for the de Havilland DHC-8-201 at 15000' is 239 kts. Maximum operating airspeed (Vmo) for the de Havilland DHC-8-201 at 20000' is 223 kts. What would you expect Vmo to be at 25000'?

A. 203 kts
B. 207 kts
C. 212 kts
D. 220 kts

31. Landing on Runway 3, the tower reports wind as 140@12 kts. What is your crosswind component?

A. 4.1 kts
B. 6.8 kts
C. 9.4 kts
D. 11.3 kts

32. Departing Runway 34 at KAVL, field elevation 2165' MSL, you follow the Asheville One Departure procedure that requires a 300' per nm climb gradient to 4800' MSL. If you hold the climb rate of 300' per nm and it takes you 6 minutes 12 seconds to reach 4800' MSL, what is your goundspeed?

A. 48.7 mph
B. 85.0 mph
C. 97.8 mph
D. 154.6 mph

Use the following information for questions 33 and 34.

Winds:	3000	6000	9000	12000
	0000	3612	2718	1830

TAS = 168 mph TRUE COURSE = 042° VAR = 4° WEST
Fuel on board = 207 pounds Fuel burn = 14.6 gph

33. What altitude will allow you to fly the furthest, then return to your starting point?

A. 3000'
B. 6000'
C. 9000'
D. 12000'

34. What is the furthest distance will you be able to fly and return to the starting point?

A. 148.5 sm
B. 172.5 sm
C. 198.5 sm
D. 224.5 sm

35. Flying direct from Tokyo to San Fransisco at Flight Level 410, the DME shows you are at 88.5 nm from San Fransisco. Directly below is a ship that is 88.0 nm from San Fransisco, how many nautical miles above the earth's surface are you?

A. 5.56 nm
B. 6.74 nm
C. 7.76 nm
D. 9.15 nm

Do NOT write your answers in the spaces shown in the following questions. Print your answers on the answer sheet. Answers written on this test will not be graded!

36. 20°C = ____°F

37. 621.4 sm = _____ km

38. 100 meters = _____ yards

39. 417 liters of Avgas = _____ kg of Avgas

40. 100 pounds of oil = _____ quarts of oil

NIFA 2004 Regional
MANUAL FLIGHT COMPUTER EXAM
Answer Key

Contestant # _____ **Number Correct: _____**

Name: _____ **Elapsed Time: _____;_____**
min sec School:
_____

MARK YOUR CHOICE COMPLETELY: SAMPLE (A)● (C) (D)

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1. (●) (B) (C) (D)
2. (A) (B) (C) (●)
3. (A) (●) (C) (D)
4. (A) (●) (C) (D)
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33. (●) (B) (C) (D)
34. (A) (B) (●) (D)
35. (A) (●) (C) (D)
36. **68^{o} F (+/- 0)**
37. **1000 km (+/- 2)**
38. **109.4 yds (+/- 1.0)**
39. **304 kg (+/- 5)**
40. **53.4 qts (+/- 1.0)**

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NIFA 2004 Regional
MANUAL FLIGHT COMPUTER EXAM
Answer Sheet

Contestant # _____ **Number Correct: _____**

Name: _____ **Elapsed Time: _____;_____**
min sec

School: _____

MARK YOUR CHOICE COMPLETELY: SAMPLE (A)● (C) (D)

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1. (A) (B) (C) (D)
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34. (A) (B) (C) (D)
35. (A) (B) (C) (D)
36. _____ ^{o}F
37. _____ km
38. _____ yards
39. _____ kg avgas
40. _____ qts oil