

Qualification	Instrument Rating (Airplane) (Rotorcraft)	No. of questions; time allowed	20 questions; 2 hours
Subject	Instrument Flight - General (subject code: 14)	Code	H1CC141710

- ★ Explanatory Notes:

 - (1) In the designated spaces on the Airmen's Academic Examination Answer Sheet (Multiple-Choice Answers) (mark sheet), write your examinee number, examinee number mark, subject, subject code, subject code mark, qualification, qualification category, name, and date of birth.
If you write your examinee number, examinee number mark, subject code, and/or subject code mark incorrectly, computer grading will not be possible and you will fail the subject.
 - (2) Write your answers on the Airmen's Academic Examination Answer Sheet (Multiple-Choice Answers) (mark sheet).
 - (3) You don't need to submit the navigation log.

- ★ Point Allocation:

All questions are worth five points each.

- ★ Pass Mark:

The pass mark is 70 %.

[Flight plan exercise]

Complete the navigation log and answer Questions 1 to 6 with regard to the following flight plan for a flight to be conducted under instrument flight rules.

Day of departure: yymmdd

Estimated time of departure: 08:00 (JST)

Departure airport: ZZ Airport

Destination airport: YY Airport

Alternate airport: WW Airport

Cruising altitude: 16,000 ft

Route: ZZ Airport → A-VOR → B-VOR → C-VOR → D-VOR → YY Airport

Route to alternate airport: YY Airport → E-VOR → WW Airport

Cruising altitude to alternate airport: 9,000 ft (climbs and descents not taken into account)

Performance particulars

Speed (TAS): Climb 150 kt; cruise 200 kt; descent 180 kt

Fuel consumption rate: Climb 900 lb/h; cruise 500 lb/h; descent 360 lb/h

Climb rate: 2,000 ft/min

Descent rate: 1,000 ft/min

Flight details:

- 1) For departure, arrival, approach and landing, the aircraft flies the "ZZ Airport - A-VOR - B-VOR - C-VOR - D-VOR - YY Airport" route according to the entry in the navigation log. The elevations of the departure and destination airports are both 0 (zero) ft. No crossing altitudes are designated between take-off and cruising altitude. Descent shall be commenced so that the altitude will reach 0 (zero) ft at the destination. No crossing altitudes are designated on the descent.
- 2) Wind direction/velocity values to be used for calculations are 240°/26 kt for the climb, 285°/26 kt for the descent, and the values in appropriate boxes in the navigation log for cruising altitude. These wind directions are stated relative to magnetic north.

Question 1: Which of the following estimated times of arrival (JST) to YY Airport is the closest to the planned time?

- (1) 10:04
- (2) 10:10
- (3) 10:16
- (4) 10:22

Question 2: Which of the following headings is the closest to the compass heading (CH) when the aircraft proceeds to cruising after taking off ZZ Airport and climbing?

- (1) 193°
- (2) 198°
- (3) 213°
- (4) 218°

Question 3: Which of the following points is the closest to the point where the aircraft reaches the cruising altitude after taking off from ZZ Airport?

- (1) Point where the aircraft has flown 17 nm from ZZ Airport
- (2) Point where the aircraft has flown 10 minutes after taking off from ZZ Airport.
- (3) Point where the aircraft has flown 47 nm from ZZ Airport
- (4) Above A-VOR

- Question 4: If this flight is not for air transport service and the alternate airport is indicated in the flight plan, which of the following quantities is the closest to the minimum quantity of fuel that must be carried by the aircraft prior to departure from ZZ Airport as designated by the Act? (Calculate to the first decimal place for each leg.)
In the case of a rotorcraft, consider the fuel consumption rate during holding to be the same as that during cruising.
- (1) 1,440 lb
 - (2) 1,550 lb
 - (3) 1,640 lb
 - (4) 1,750 lb
- Question 5: At 10 minutes after passing over B-VOR, measurement of GS was performed. The aircraft proceeded 4.4 nm in 1 minute 39 seconds. CH was kept at 270°. In this state, how many of the following statements (a) to (d) regarding the navigation particulars are correct? Choose from (1) to (5) below.
- (a) ETA of C-VOR calculated from ATA of B-VOR coincides with that on the navigation log.
 - (b) WCA is +10°.
 - (c) The wind velocity is the same as the forecasted wind velocity.
 - (d) The actual wind direction is generally from the south.
- (1) 1 (2) 2 (3) 3 (4) 4 (5) None
- Question 6: Regarding the navigation particulars obtained from the completed navigation log, how many of the following statements (a) to (d) are correct? Choose from (1) to (5) below.
- (a) Above C-VOR, if the pressure is 29.92 inHg and the outside temperature is -10°C, CAS is approx. 260 kt.
 - (b) The time required from YY Airport to the airspace over WW Airport is less than 30 minutes.
 - (c) TOD to YY Airport is the point 57 nm away from YY Airport on the course.
 - (d) The quantity of fuel required for descending is less than that for climbing.
- (1) 1 (2) 2 (3) 3 (4) 4 (5) None
- Question 7: Which of the following statements regarding the recent flight experience of flight crew-members engaged in instrument flight is correct?
- (1) Flight crew-members carrying out instrument flight shall have more than 6 hours of instrument flight experience (including simulator flight) over the 180 days preceding the date of the flight.
 - (2) The experience of simulated instrument flight shall be wholly regarded as the experience of carrying out instrument flight.
 - (3) Of the time of experience of navigation using an aircraft simulator according to methods designated by the Minister of Land, Infrastructure, Transport and Tourism, half of it shall be regarded as the experience of carrying out instrument flight.
 - (4) The experience of navigation using a flight training device according to methods designated by the Minister of Land, Infrastructure, Transport and Tourism shall not be regarded as the experience of carrying out instrument flight.
- Question 8: Of the following combinations of abbreviations used in the aeronautical information service and their full spellings, which one is incorrect?
- (1) SID: Standard instrument departure
 - (2) MEA: Minimum enroute altitude
 - (3) MRA: Minimum reporting altitude
 - (4) EAT: Expected approach time

Question 9: The following (a) to (d) are combinations of symbols used to fill in item 10 (Radio communication, navigation and approach aid equipment) of the flight plan and their meanings. How many of these combinations are correct? Choose from (1) to (5) below.

- (a) E: ELT
- (b) G: GPWS
- (c) I: ILS
- (d) O: VOR

(1) 1 (2) 2 (3) 3 (4) 4 (5) None

Question 10: Of the following definitions of ATS routes, which one is incorrect?

- (1) RNAV routes: Routes specified for aircraft navigating under RNAV.
- (2) OTRs: Routes which connect a ground Navaid and a fix in an oceanic control area and are announced as oceanic transition routes.
- (3) Transition routes: Routes, etc. specified between the terminal fix of an SID and a fix on an airway to supplement SID.
- (4) Direct routes: Routes which connect two fixes directly for aircraft navigation without using Nav aids.

Question 11: Of the following methods of flying (a) to (d), how many of them apply to that for instrument flight, etc.? Choose from (1) to (5) below.

- (a) A flight which is performed relying solely on flight instruments to measure the position and course of the aircraft under visual meteorological conditions.
- (b) A flight under special VFR obtaining the permission of the Minister of Land, Infrastructure, Transport and Tourism under instrument meteorological conditions.
- (c) A flight which is performed relying solely on flight instruments to measure the attitude, altitude, position, and course of the aircraft in the clouds.
- (d) A flight, under visual meteorological conditions, in an air traffic control zone or control area, on a route specified by the Minister of Land, Infrastructure, Transport and Tourism, constantly following the instructions on other methods of flight given by the Minister of Land, Infrastructure, Transport and Tourism

(1) 1 (2) 2 (3) 3 (4) 4 (5) None

Question 12: Of the statements (a) to (e) below, how many of them apply to the condition described by the weather minima and the minimum descent altitude shown in the approach chart below? Choose from (1) to (5) below.

MINIMA		THR elev. 586		AD elev. 607		
CAT	CAT I		LOC		CIRCLING	
	DA (H)	RVR/CMV	MDA (H)	RVR/CMV	MDA (H)	VIS
A	805 (219)	600	1000 (414)	900	1060 (453)	1600
B				1000		
C				1400	1280 (673)	2400
D						3200

Circling to NORTH side of RWY only.

- (a) The height of the reference point of the airport is 586 ft.
- (b) The decision altitude is 219 ft.
- (c) The weather minima for the localizer approach is the same for all aircraft categories.
- (d) For the circling minima, only the ground visibility is applied.
- (e) For the circling approach, the direction of circling is limited.

(1) 1 (2) 2 (3) 3 (4) 4 (5) 5

- Question 13: Which of the following definitions of the final approach route is incorrect?
- (1) The segment from the starting point of the base turn or procedure turn to the missed approach point (MAPt)
 - (2) The segment from the final approach fix (FAF) to the missed approach point (MAPt)
 - (3) On ILS approach, the segment from the FAF to the missed approach point (MAPt)
 - (4) Any instrument approach procedure has its final approach segment.

- Question 14: Which of the following statements regarding the contact approach is incorrect?
- (1) The contact approach is an approach by an IFR aircraft when either part or all of an instrument approach procedure is not completed and the approach is executed in visual reference to an airport.
 - (2) The clearance for the contact approach will be issued by ATC, upon the pilot's request, when the ground visibility is at least 1,500 meters and traffic permitting.
 - (3) The contact approach is usually approved with the phraseology "CLEARED FOR CONTACT APPROACH". When the approach has been approved without specifying the type of approach, the pilot only needs to notify his intention to make the contact approach to the landing airport's Advisory Service Unit.
 - (4) When an aircraft is performing the contact approach and landing, the meteorological minima promulgated at the airport should not be applied.

- Question 15: The following statements (a) to (d) describe the cases when VDP for the non-precision, straight-in approach is not announced. How many of these statements are correct? Choose from (1) to (5) below.
- (a) The existing navigation procedure does not use DME in the final approach phase.
 - (b) The approach procedure to an airport without PAPI
 - (c) VDP is located before the step-down fix
 - (d) VDP is located between the missed approach point and the runway threshold.
- (1) 1 (2) 2 (3) 3 (4) 4 (5) None

- Question 16: A pilot may continue the approach below DA/H or MDA/H provided that at least one visual reference is established at DA/H or MDA/H and is maintained so that the landing might be completed. How many of the following items (a) to (d) can be used as the above visual reference for non-precision approach, ILS approach (CAT I) and PAR approach? Choose from (1) to (5) below.
- (a) Part of approach lights
 - (b) Runway touchdown zone lights
 - (c) Precision approach path indicator
 - (d) Runway edge lights
- (1) 1 (2) 2 (3) 3 (4) 4 (5) None

- Question 17: At an airport where the RVR information service is suspended, which of the following items can be the minima to continue approach under the following conditions?

Conditions	
Approach time	Daytime
Approach procedure	ILS (CAT I), straight-in approach
Runway facilities	Full facilities
Operating conditions of aerodrome lights	Normally operating except for RCLL
Announced weather minima	DH: 200 ft, RVR/CMV: 750 m

- (1) Ground visibility: 400 m
- (2) Ground visibility: 500 m
- (3) Ground visibility: 1200 m
- (4) The approach cannot be continued because RVR information service and RCLL are unavailable.

- Question 18: The following statements describe the procedure when a communication failure occurs while navigating under IFR. Which one is incorrect?
- (1) If an aircraft is in visual meteorological conditions, the aircraft shall continue to fly in visual meteorological conditions and land at the nearest airport, etc. where a safe landing is considered possible.
 - (2) If an aircraft is in instrument meteorological conditions, the aircraft shall proceed according to the last assigned route to the point over the destination.
 - (3) If an aircraft is in instrument meteorological conditions and the approach clearance had been issued before the communication failure, commence descent after holding over the point until the time when the total estimated elapsed time in the flight plan has elapsed after take-off.
 - (4) If an aircraft is in instrument meteorological conditions and the holding instruction and EAT had been received before the communication failure, commence descent after holding until EAT.

- Question 19: Which of the following statements regarding hypoxia is correct?
- (1) Hypoxia from exposure to altitude is due only to the reduced barometric pressure encountered at altitude, because the concentration of oxygen in the atmosphere remains about 21 percent from the ground out to space.
 - (2) Symptoms of hypoxia vary largely between individuals. When they occur gradually, a person can recognize them easily.
 - (3) Hypoxia is closely related to the oxygen-carrying capacity of the blood, and generally it is not related to the effects of alcohol, drugs, and physical and mental conditions.
 - (4) If you notice symptoms of hypoxia, you can alleviate them in a few minutes by controlling the speed and depth of breathing. Breathing in through the nose and exhaling through the mouth with the lips sealed (abdominal breathing) is effective.

- Question 20: Which of the following statements regarding illusions in flight is incorrect?
- (1) Sloping cloud formations, an obscured horizon, a dark scene spread with ground lights and stars, and certain geometric patterns of ground lights can create the illusion of not being aligned correctly with the actual horizon.
 - (2) An absence of ground features, such as when flying over water, darkened areas, and terrain made featureless by snow, can create the illusion that the aircraft is at a lower altitude than it actually is.
 - (3) In the dark, a static light will appear to move about after staring at it for several dozen seconds. The disoriented pilot will lose control of the aircraft by attempting to align it with the light.
 - (4) Various complex motions and forces and certain visual scenes encountered in flight can create illusions of motion and position. Spatial disorientation due to these illusions can be prevented only by visual reference to reliable, fixed points on the ground or to flight instruments.

NAVIGATION LOG																				
ETD : JST																				
TIME		DEPARTURE AP					FUEL													
TO DESTINATION		ZZ	YY	BURN OFF	lb	RESERVE	lb	RESERVE	lb	ZZ	YY	BURN OFF	lb	RESERVE	lb					
FR DESTINATION TO ALTERNATE		WW	ALTERNATE AP	WCA	MC	WCA	MH	DEV	CH	Z DIST	C DIST	G/S	Z TIME	C TIME	ETO	F/F	Z FUEL	C FUEL	REMARKS	
ZZ																				
- A	285/36		209					1E		64										A VOR
- B	310/30		184					1E		90										B VOR
- C	280/42		260					2E		112										C VOR
- D	265/20		357					1E		20										D VOR
- YY	290/20		227					2E		101										
YY																				
- E	260/12		114					1E		63										E VOR
- WW	290/23		083					1E		33										