Areas that I often find to be problematic for applicants for Instrument rating are the following:

Cross country planning: The most common error is the applicant taking a "course" from garmin pilot or other app for their cross country and have no idea if it is a **True Course, Magnetic Course, Magnetic Heading, Compass Heading**. Then apply wind correction and magnetic variation to the number not realizing the program has already done it. This can induce significant navigation errors that are hard to explain by the applicant. Know what your app is telling you and what the number means.

Traps of EFB. Please see my discussion in the Instrument Syllabus. It is primarily about Foreflight, but there are many similar traps in Garmin Pilot.

1) Departures: Seriously. IF you are at an unfamiliar airport, can you determine how to depart without hitting something? This sounds simple but is a common difficulty for applicants. Key concepts include:
    a. How do we know if an airport is surveyed to determine if it needs a departure procedure? (What is an Obstacle Identification Surface? What is it used for?)
    b. Once airport is surveyed, if no obstacle penetrates the OIS, how are we expected to depart and what aircraft performance do we need to avoid obstacles? When can we turn on course?
    c. Using the TERPS or your EFB (Foreflight/Garmin Pilot) can you determine what obstacle departure procedures are available and when and how to use them? What is the difference between a departure procedure and Take off departure minimums (departure minima are frequently confused with DPs)?
    d. Use of Climb table. Climb performance tables require determining your ground speed in the climb. Using your performance charts, can you calculate GS from the IAS? How do winds aloft affect performance? Density altitude?
    e. Now that we figured out how to leave safely, how do we get a clearance on the ground if there is no control tower?
2) How and when to execute a missed approach for:
    a. Straight in precision and non-precision approach
    b. circling to land. Review the regs about how to execute a missed while circling to land. AIM 5-4-21, 14 CFR 91.175..
3) What is the first thing you see on an approach that allows you to descend from an MDA or DA? How far can you descend?
4) What do you need to visualize to descend to land? What are the limits of maneuvering allowed while descending to land on a straight in or circling approach?
5) Lost comms- everyone knows AVEF and MEA but do not know where their **clearance limit** is and when and how to get on an approach. Review how the regs want us to get on an approach and when.
6) Understanding how the CDI sensitivity changes for WAAS GPS in different phases of flight and during approaches compared to ground-based navigation (ILS, VOR)
7) Chart symbols. Be familiar with both those on approach plates and enroute. Know where the legends are in case you have to look something up.
8) Understanding your installed equipment. If you have The G1000, G500, G3x and other glass panels have some basic components that the pilot should be familiar with. They are

referred to as LRU. Look up the basic function of the flight data computer, AHRS, and magnetometer and be able to describe what they do and how they get information to the PFD for the pilot to see.

9) If you have a glass panel, how does the ADC determine airspeed, altitude, vertical speed? How does the AHRS get heading information? What is a magnetometer and how does it work? How does AHRS make the attitude indicator work?
10) if there is a failure in these units, what the pilot has to do in Instrument conditions to fly safely. What are the backups? The Pitot static system is the same as other aircraft but feeds it to the digital components.
11) Be able to discuss the basic principles and malfunctions of the Pitot Static system, gyros. How can you tell if your static ports iced up? What can you do to get them working again? What errors are there with static ports iced over and what risk is there during approach and landing? What about the pitot tube?
12) How does radar work? How do you interpret radar? What are the risks of flying through precipitation? Can you get airframe icing flying in snow? Why or Why not?
13) What conditions are you likely to get ice on aircraft? What are the common names for visible moisture? What weather reports or forecasts do we use to determine where icing might exist? (Hint: **Probability and Severity of Icing forecast by altitude charts** are incredible resource that will tell you where icing is, severity and type of icing you might encounter) practical understanding of how to determine icing risks.
    a) Draw a sketch of an aircraft and be able to label where ice accumulates, how it affects the aircraft performance and what equipment or techniques do you have to mitigate those adverse effects including:
        a. Propellor
        b. Engine air intake
        c. Carburetor
        d. Wings
        e. Wind shield
        f. Control Surfaces- ailerons, flaps, elevator
        g. Horizontal Stab
        h. Pitot tube and static port
        i. Gear
        j. Nav/comm antennas
    b) what phase of flight does tail plane icing cause problems and how to reduce the risks
    c) how to interpret icing reports, PIREPS, (trace, light, moderate and severe icing) and runway conditions reports (where found and what do the numbers mean),
    d) risk mitigation for possible icing (exit strategies) for XC planning.
    e) What ice mitigation equipment is on board.
    f) Will the engine stop if the intake filter is coated in ice? Why? Why not?
    g) What is tail plane icing and what phase of flight does it cause trouble?
    h) What phase of flight does icing pose the biggest threat? How are you going to mitigate the risk?
    i) Be able to briefly describe anti and de-icing equipment that is available on aircraft and how used.
14) know how to file an IFR flight plan (ICAO). It is required by the ACS. This includes having access to a cheat sheet or some other way of determining the equipment codes for

your aircraft. Go to 1800WXbreif.com and practice filling out those forms on line. Print off their quick reference cards. It will save you a lot of time in the practical. Trusting and only using Garmin pilot or Foreflight to file a ICAO instrument plan does not meet the minimum standard in the ACS.

15) **on board weather reporting**. What is ADS-B and FIS-B and TIS-B? how does that information get in the aircraft and on the screen (either glass panel or your IPAD). What are the limitations of that information in regards navigating severe weather? Do you have XM weather capability? How does this differ from FIS-B (AKA as ADS-B in).
16) When and how to choose an alternate airport. Does the airport have non-standard alternate minimums? What if you arrive after the tower closes, can you still use the ILS at that airport for your alternate minimums? What if the ATIS/AWOS is IN-OP? Or do you have to use a GPS approach? How does that change if the airport qualifies for an alternate with the given weather?
17) how pilots get behind the aircraft and subsequently do not meet the minimum ACS standards. on flying approaches, many applicants become fixated on all the various procedures, programing, and check lists, they forget to fly the airplane (pay attention to the most fundamental aspects of each phase of flight). For example, running the before descent to land check list 1 mile before the FAF is probably not a good idea, that should have been done long before. It is the simple things that applicants fail to do that cause the biggest problems such as
    1) forgetting to activate the approach on a GPS
    2) forgetting to activate VTF when appropriate
    3) making sure the ILS or VOR frequency is in the active slot and changing the CDI to VLOC
    4) chasing airspeed on the approach
    5) chasing the CDI needle instead of making small definitive corrections and waiting for response
    6) getting distracted or fixated on the last part of an approach and bust MDA, DA or exceed the ¾ scale deflection.
    7) loss of confidence on holding procedures and other flight maneuvers via automation dependence.
    8) searching for the missed approach procedure AFTER reaching the MAP.

Try flying holds, approaches, going missed without all the automation, with minimal instrumentation and minimal use of accessories. Nail the fundamentals. To a certain extent, the automation is information overload and can become distracting or even confusing under pressure such as on a check ride. **Make sure to have a plan for each approach, missed or hold BEFORE hand and be ready to execute with minimal consultation of IPAD and electronic devices.**

Again, this is another observation on how pilots sabotage themselves. The check ride is about meeting the minimum ACS standards. Over reliance on IPAD for situational awareness leads to failure to meet ACS standards. **The IPAD itself is a very useful tool if used correctly**. However, If you are looking down constantly at your IPAD on an approach, you clearly are not flying the approach or do not have confidence in how to fly the approach. Practice flying approaches with geo-location (little airplane on IPAD) turned off. Practice flying approaches with IPAD closed. **Know the missed approach before you shoot the approach**. IF you are looking down at IPAD to determine your missed approach at MAP or shortly after, this will lead to loss of situational awareness and aircraft control. If you need your IPAD to tell you how to enter a hold or where to turn for an approach, you do not have the requisite skills and situational awareness to pass a check ride. **The IPAD is to be used as a substitute for a paper chart or paper approach plate, not a navigational moving map and step by step instructions for an approach.**

Finally, if I told you there was a document that had ALL the questions that were on a final exam, would you study it carefully before the test? Of course, you would. That document is called the ACS. Make sure to be very familiar with the knowledge and flying requirements as detailed in the ACS. Good luck and I am hoping for the best outcome!