Question 1: **How do financial institutions identify and manage risks relating to AI explainability?**

Ideally financial institutions should strive for explanations which are understandable by the operations teams who are using the output of the model. An explanation that can even be approximately reproduced by the users own hand-calculations is the most ideal (for example, simple Bayesian weightings for each feature).

Question 4: **How do financial institutions using AI manage risks related to data quality and data processing?**

Models which provide a confidence value are preferred since this allows for manual review/override in the case of lower confidence model decisions. The confidence thresholds allow a balanced trade off between precision and recall which takes into account the risk and operational costs of false positives and false negatives for each class.
Calibration/reliability curves are used to ensure the confidence value corresponds to the actual classifier accuracy.

Question 9: **Do community institutions face particular challenges in developing, adopting, and using AI? If so, please provide detail about such challenges. What practices are employed to address those impediments or challenges?**

Smaller institutions face particular challenges due to the more limited availability of in-house machine learning knowledge needed to implement model governance. Also, since the absolute efficiencies benefit for a community institution is usually smaller due to lower business volume this makes it harder to justify the large fixed overhead needed to perform due diligence for each adopted model.

Question 10: **Please describe any particular challenges or impediments financial institutions face in using AI developed or provided by third parties and a description of how financial institutions manage the associated risks. Please provide detail on any challenges or impediments. How do those challenges or impediments vary by financial institution size and complexity?**

As your notes indicate, "Many of the potential risks associated with using AI are not unique to AI". However, an impediment to adoption of machine learning solutions is that model governance programs at financial institutions are only applied to the use of learning based machine learning models and is not applied to other more pre-existing and traditional technologies.
E.g. in many use cases in financial services business rules (falling rule classifiers) are already being used to make operational decisions. In some cases these rules may encode explicit business constraints but in other cases they may be used to encode more fuzzy behaviour which is either based on hand-coded or learned 'rules of thumb' (e.g. string matching).
Such fuzzy encodings should be subject to the same model governance requirements as is applied to machine learning classifier systems since fuzzy logic is also susceptible to concept drift and correctness issues. Even worse often there is no statistical justification or validation for the manual construction of these rules.

Another impediment is the lack of any Federally certification program for machine learning based vendor solutions. Each and every financial institution is having to reinvent the wheel by interpreting Federal regulations, designing their own model governance, reviewing, evaluating every model itself and even then they cannot be 100% sure that it is in compliance with all Federal regulations and guidelines.
Introduction of a government certification program for vendors would remove this impediment, ensure compliance for users of that vendor solution and dramatically expedite a financial institution's model approval process.
These pre-certified vendor solutions could be performed for common use cases in financial services such as fraud detection, credit scoring, transaction matching, anti-money laundering etc.
As an analogy the car industry certifies vehicle design so each and every consumer doesn't have to perform their own safety testing on their car.

As an additional benefit a Federally certified benchmarking program could also assist with the adoption of machine learning technologies by providing pre-measured key model KPIs and production KPIs such as sensitivity, concept drift on carefully chosen example benchmark datasets.