23-S1-Q3

Q: (a) different?

① Algorithmic different: Encoders can implement different algorithms for processes like motion estimation, mode decision and rate control

② Encoders might choose different strategies for intra-prediction, entropy coding or transform implementations

③ Hardware limitation

④ use of optinal features

(b) coding efficiency: from high to low

B frame > P-frame > I-frame

Reason: ① It require the decodere to store and process more frames, increasing load and memory

② Error Propagation: if data loss or corruption errors in reference frames can adversely effect multiple B-frame

③ It will require more Buffer to store reference frames.

④ Delayed Display.

(c)

I B B P B B P

1 3 4 2 6 7 5

① B-frames rely on both preceding and succeeding reference frame for decoding

② P-frames rely on preceding frame for decoding

③ Pecoding reference frames early minimizes delay

(d) ① Tracking-by-Detection

Detect objects in individual video frames associate sets of detections between frames, thereby creating individual object tracks over time.

② Trackformer

perform joint object detection and tracking-by-attention with Transformer

difference:

	Tracking-by-Detection	Trackformer
order	detection followed by association	End to end: integrated detection + tracking
model	kalman Filter . ReID embedding	attention
rely on detector	quality of tracking dependon detection	jointly optimized
model	mix different detectors and tracker	transformer-base
occulsion	struggles due to reliance on IoU	better with attention capturing context
computational cost	lower	higher due to transformer