Question 1:

1.1 Other AWS technologies:

1. use Elastic Load Balancing to distribute the traffic to different EC2 instances and scale the load balancers as incoming traffic changes over time

2. use S3 bucket to store some object, such as the video

3. use RDS such as MySQL to store some table, such as users table

4. use Mobile Hub to develop and deploy the web app

Architecture: Use the web architecture like this. And install the nginx, Django on EC2 instances.

RDS

S3

EC2

EC2

EC2

ELB

mobile app

browser

1.2 How change to serverless architecture:

Use the microservices architecture. It’s hosted on lambda (serverless). Front end is via an API Gateway that defines a programmatic interface to the services.

Compared with the previous architecture:

Advantages:

It’s micro and save money to run and maintenance.

Update each service will not affect other services.

It’s loosely coupled services so improve the flexibility.

Disadvantages: the functionality is limited?

Question 2:

2.1

We can use the AWS machine learning services. Firstly, we can let the marks of lab and mid-test as feature variables. And the final exam mark is target variable which we want to predict. Next, we split the last year data to training set (80%) and evaluation set (20%). Finally, we use the linear regression model on AWS to predict the final exam mark.

2.2

We use the linear regression model. We can use the loss function to calculate the training error. Then use optimisation algorithm to minimize error, such as SGD. Finally, we can use the RMSE to analysis the result.

Question 3:

Use the S3 bucket to store the data uploaded from users, because S3 is proper to store the object like images, which including the data and metadata

Use the glacier to backup the file in the case of users deleting the file on purpose they can retrieve a backup from Glacier which takes longer to access

Use the amazon rekognition services, which can help to label recognition and perform searches of images based on the generated labels

Question 4:

1. AWS recognition – process the images

2. S3 bucket - store the images

3. EC2 instance – as a back-end server

4. load balancer – distribute the traffic

5. IAM – create users and give them roles and permissions so that only royal Perth hospital can write and other hospitals can read

6. DevOps - create automation for the entire build/test/release cycle for this product

7. Django – a web application framework that user can access on browser by using HTTP

8. nginx – as a proxy of Django app to handle the HTTP request

9. DynamoDB – store some key-value data like user table

10. AWS machine learning – it also can help to process the images, such as classification

Question 5:

Pros:

1. it’s very easy to horizontal scaling for this rapid growing company

2. the AWS can easily access from everywhere over the world

3. it save much money to maintenance the data center

4. pay-as-you-go model, the company only should pay what they use

5. there are many services available on AWS, such as they can use machine learning

Cons:

1. it’s difficult to change to another cloud in the future

2. the cloud may leak some confidential data

3. if there is a outrage in the cloud, it will affect the total system

4. some data may not be stored in the cloud according to the regulations, such as finance

5. some software may have software license on specific computer