

Subjective Part

Question 1

- (a) Marine sediments cover approximately 25% of the seafloor. How marine sediments deposited into the sea basin? [5 marks]
- (b) The El Niño-Southern Oscillation (ENSO) is a recurring climate pattern involving changes in the temperature of waters in the central and eastern tropical Pacific Ocean. Explain the El-Niño conditions. [5 marks]

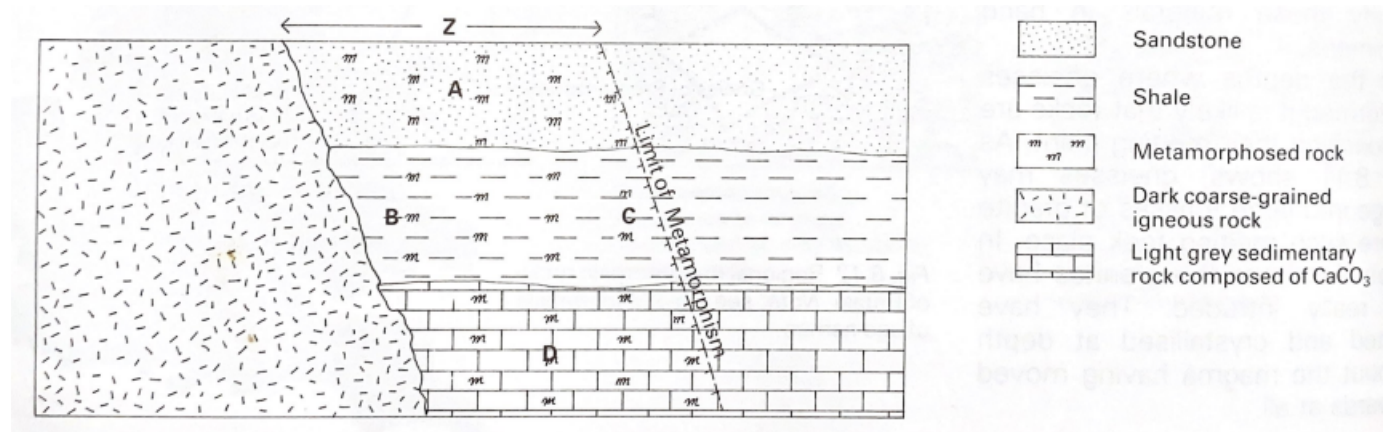
Question 2

Heat is thermal energy transferred from one object to another. Insolation or shortwave radiation energy that strikes the Earth's surface can be converted into sensible heat and latent heat. Sensible heat and latent heat is important in determining every day weather.

- (a) Define sensible heat and latent heat. [4 marks]
- (b) Briefly explain the process of shortwave radiation converted into sensible heat. [2 marks]
- (c) Briefly explain the process of shortwave radiation converted into latent heat via the process of latent heat vaporization and latent heat sublimation. [4 marks]

Question 3

Based on the Figure 1 below, answer the following questions.



- (a) What is Zone Z and what is the name of this type of metamorphism? [1 mark]
- (b) Name the igneous rock which forms the intrusion. [1 mark]

(c) Name the metamorphic rock that you would expect to find at A, B, C and D. [4 marks]

A:

B:

C:

D:

(d) Describe the appearance and textures that you would expect to see in specimens from B and C. How would these rocks differ from the surrounding shale? [3 marks]

(e) Give one economic use for the rock that can found in D. [1 mark]

Question 4

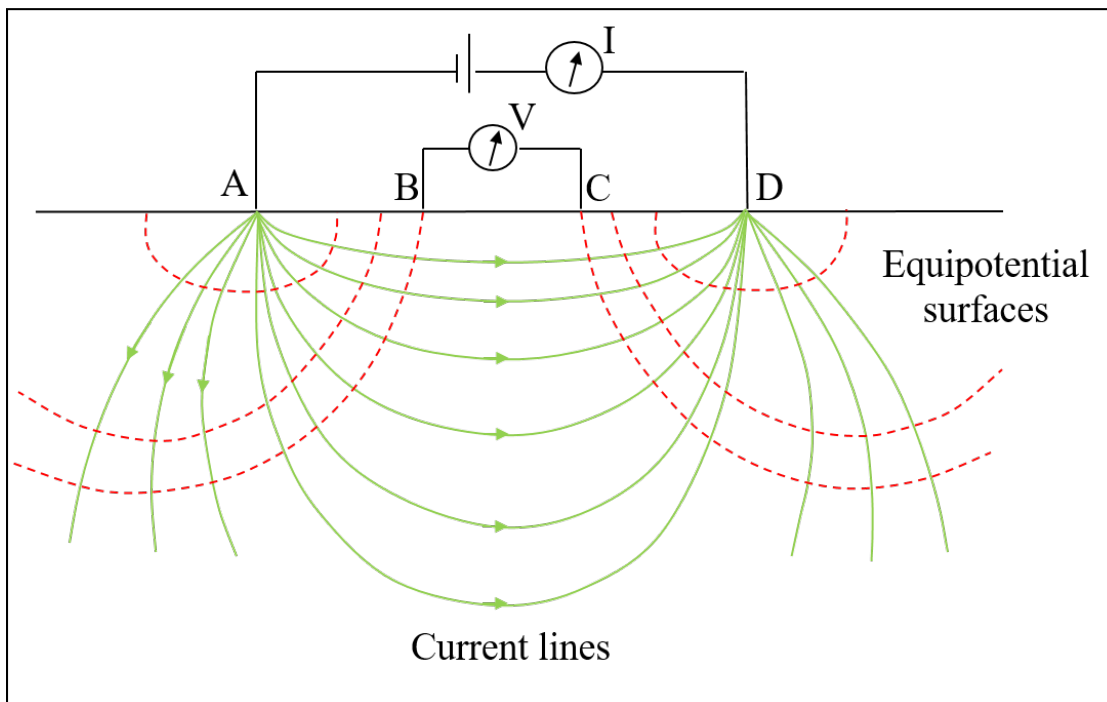


Figure 2: Electric field around the electrode (modified from Said, 2007).

(a) Name the following:

A:

B:

C:

D:

[4 marks]

(b) Resistivity method used electrical measurement and it has three main properties. Describe:

- i. Resistance (R):
- ii. Capacitance (C):
- iii. Inductance (I):

[6 marks]

Question 5

Table 1 below shows a planetary physical data of all 8 planets in our solar system.

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
Mean distance from the Sun (AU)	0.39	0.72	1.00	1.52	5.20	9.54	19.19	30.06
Orbital period (Earth years)	0.24	0.62	1.00	1.88	11.86	29.46	84.01	164.79
Average Orbital velocity (km/s)	47.89	35.04	29.79	24.14	13.06	9.64	6.81	5.43
Mass of planet (Earth mass)	0.06	0.82	1.00	0.11	317.89	95.18	14.53	17.14

Table 1: Planetary physical data.

(a) Based on the information in the table above:

- i. Approximately, how much further is Saturn from the Earth? [1 mark]
- ii. Does the orbital period depend on the planet's distance from the Sun? Describe it. [[2 marks]
- iii. Does the orbital velocity depend on the planet's distance from the Sun? Describe it. [2 marks]
- iv. Does the mass of the planet depend on the planet's distance from the Sun? Describe it. [2 marks]

(b) Assume a tiny planet is discover between Mercury and Venus. Based on your understanding of our solar system, describe the following:

- i. The orbit of the tiny planet is most likely to be: [1 mark]
- ii. The surface of the tiny planet is most likely to be: [1 mark]
- iii. The rotation of the tiny planet is most likely to be: [1 mark]

Essay Part

Question 1

Cavity or void is an empty space inside a solid body or object. The discovery of cavities is important since the presence of natural voids or cavities at the subsurface particularly at limestone area which may causes some severe problems that can be related with engineering management. Explain in detail how cavity cause problem to engineering and environmental. Name one geophysical method that is suitable to identify the cavity. **[10 marks]**

Question 2

Explain the geological process involved when oceanic plate meets continental plate. Support your answer with example and illustration. **[10 marks]**

Question 3

Sketch and explain how variation in isolation influence the climate in the Tropics, Subtropics, Mid-latitudes, and Polar region. **[10 marks]**

Question 4

The oceanic, wind driven Ekman Spiral is a common current flow in the ocean. Explain the formation of Ekman Spiral and how it acts as ocean heat transport? **[10 marks]**

Question 5

Venus is also called as the Earth's Twin planet due to their similarities in size and mass. Beside the distance from the Sun, mass, orbital speed, and orbital period; please state and briefly elaborate FIVE more differences between The Earth and Venus. **[10 marks]**

END OF QUESTION PAPER