ILARA MOKIN, ONDO STATE

FACULTY: BASIC AND APPLIED SCIENCES

DEPARTMENT: PHYSICAL AND CHEMICAL SCIENCES

SECOND SEMESTER EXAMINATIONS

2016/2017 ACADEMIC SESSION

COURSE TITLE: GEOPHYSICS AND GEOTHERMAL ENERGY **COURSE CODE: AGP 420**

DURATION: 2 Hrs 30 minutes

TOTAL MARKS: 60 MARKS

HOD's SIGNATURE

Matriculation Number: _____

INSTRUCTIONS:

- Write your matriculation number in the space provided above and also on the cover page of the exam booklet.
- Answer all questions in the exam booklet provided.
- At the end of this examination, place the question paper inside the exam booklet.
- **Answer questions 4 and 5 and any other two questions.**
- **Detach and submit Figure 1 with your answer booklet**

1 Define briefly:

a. Geothemal Energy
b. The interplay of geophyscis and the Earth's internal structure and justify
c. The uses of geothermal energy.

(15 marks)

2a Distinguish between a thermal area and a thermal field and discuss the three broad classes of both.
2b Describe the geophysical methods you will adopt in geothermal exploration.

(15 marks)

3a Appraise the gblobal energy situation
3b What factors influence the occurrence and distribution of geothermal fields?
3c Outline the various geothermal systems and their distinct characteristics.

(15 marks)

4a With a detailed diagram, describe the divided-bar method of determining thermal conductivity of a rock sample.

4b Two concentric spherical shells of radius 5 and 15 cm respectively have their annular cavity filled with charcoal. When energy is supplied at a steady rate of 10.8 W to a heater at the centre, a temperature difference of 50^0 C is set up between the spheres. Find the thermal conductivity of the charcoal. (15 marks)

5 Integrated geophysical methods were used for the evaluation of Coso geothermal area, California, USA. Figure 1 shows the aeromagnetic contour map derived from a low-altitude aeromagnetic survey of the area. The contour interval is 200 nT.

a. Delineate (shade) area(s) of suspected high geothermal potential.
b. What is the basis of your answer in (a) above.
c. Shallow temperature measurements were also carried out in the area. What factors influence the reliability of shallow temperature surveys?

(15 marks)

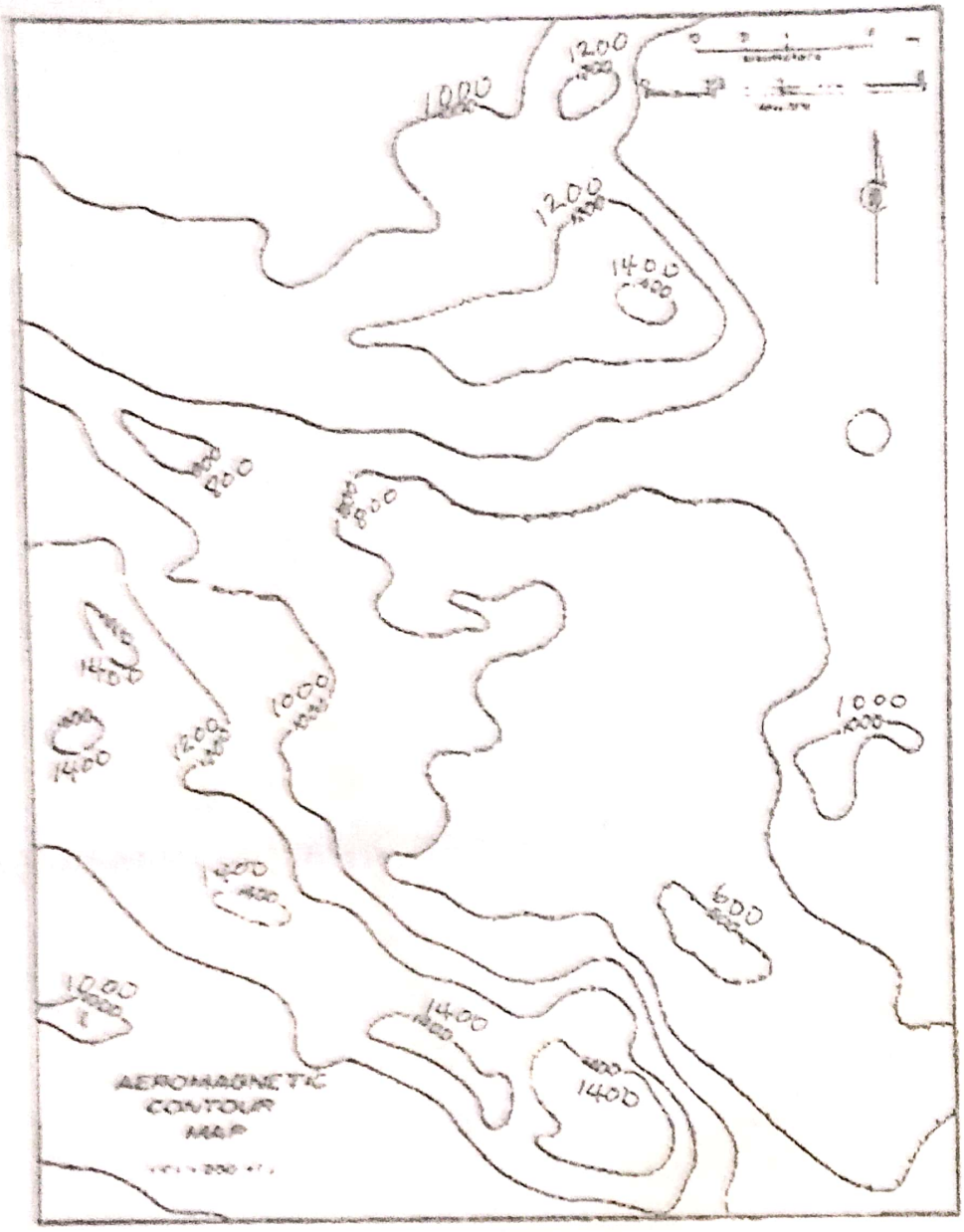

Figure 1: Low-altitude aeromagnetic survey of the Coso geothermal area, California, USA. Contour interval is 200 nT