

Roll No: -----

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End-Semester Examination, December, 2017



Program Name: B.Tech. in Mining Engineering

Semester – III

Course Name : Mine Surveying

Max. Marks : 100

Course Code : MIEG 235

Duration : 3 Hrs

No. of page/s: 2

SECTION A
(ANSWER ALL QUESTIONS)

1. Write short notes or explain briefly the followings:

- Principle of Stadia Hair Method.
- Different axis of the Theodolite
- Types of Error in surveying
- Repetition method of horizontal angle measurement.

(5*4=20)

SECTION B
(ANSWER 2, 3, 4 and EITHER 5 OR 6)

- What are the general requirements of Plans and Sections?
 - Define: Most Probable value and weight of an observation.
- Calculate the amount and direction of true dip from the following information:

Mine roadways	Bearing	Inclination
AB	S 20° E	Dipping 1 in 4
AC	N 60° E	Dipping 1 in 7

Also solve this GRAPHICALLY by plotting on the graph paper.

(7+3)

(5+5)

4. The following data observed for a Theodolite traverse ABCDE are as follows:

Line	Bearing	Length (m)
AB	S 59°45' E	217.50
BC	N 62°32' E	?
CD	N 37°36' W	?
DE	S 55°18' W	283.50
EA	S 2°40' W	173.15

Determine the missing lengths BC and CD of the traverse.

(10)

- Discuss the Weisbach triangle method for Correlation survey.
 - What are the permanent adjustments of a theodolite?

(5+5)

OR

6. a) Calculate the area between the chain line, the curved boundary and the end offsets by a) Trapezoidal rule and then by b) Simpson's rule. The offsets (**in m**) are taken at 5 m interval from a survey line.
3.82, 4.37, 6.82, 5.26, 7.59, 8.90, 9.52, 8.42 and 6.43.
- b) Calculate the Constants of the Tacheometer by the following data:
- | | |
|------------------------|--------------------|
| Horizontal distance, m | Stadia readings, m |
| 200 | 1.50, 3.46 |
| 400 | 0.40, 4.33 |
- Also calculate the distance if the readings of stadia hair are 1.20 m and 3.70 m. Assume that the line of sight is horizontal for all the cases. (5+5)

SECTION C

(ANSWER 7 and 8 OR 7 and 9)

7. a) Discuss the general features of **Any Three** plans used in Mines.
b) What is a Simple curve? Draw a diagram and show different element of a simple curve. (12+8)
8. a) A Tacheometer is set at O and at P and Q – vertical staff was placed to take readings as shown below:
- | | | | | |
|---------------|----------------|--------------------------|------|------|
| Staff Station | Vertical Angle | Stadia Hair Reading, (m) | | |
| P | -6°36' | 1.20 | 2.30 | 3.40 |
| Q | 10°30' | 0.30 | 2.10 | 3.90 |
- Calculate the horizontal and vertical difference between Stations P and Q. Assume the instrument constants were 100 & 0. Assume Height of Instrument = 100 m.
- b) The following data observed for a traverse ABCDE are as follows:
- | | | | |
|------|---------|-------------------|-------------|
| Line | Azimuth | Plan Distance (m) | Inclination |
| AB | 210° | 60 | 10° dipping |
| BC | 110° | 90 | 15° dipping |
| CD | 60° | 100 | 12° dipping |
| DE | 130° | 120 | Level |
- Determine the bearing, length and the gradient of the closing line EA. (10+10)

OR

9. a) Explain briefly the different elements of a plane table surveying.
b) The following values are observed for a triangle ABC:
 $\angle A = 62^\circ 28' 16''$ $\angle B = 56^\circ 44' 36''$ $\angle C = 60^\circ 46' 56''$
Determine the most probable values of the angles A, B and C.
c) What are the duties of a Mine Surveyor? (8+6+6)

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SECTION A

(ANSWER ALL QUESTIONS)

1. Write short notes or explain briefly the followings:

- a) Principles of surveying
- b) What are the different cumulative errors in chaining?
- c) Type of Meridian used in Surveying
- d) Profile levelling.

(5*4=20)

SECTION B

(ANSWER 2, 3, 4 and EITHER 5 OR 6)

2. a) What are the different types of chain used in Surveying?

- b) The plan of an old survey ground plotted to a scale of 100m to 1cm, found to have shrunk. So, the original 20 cm line was 19.6 cm. it was also found that the 20m chain used for measurement was 10cm too long. If the area of the plan measured now is 150 cm², find the true area of the survey on the ground.

(5+5)

3. a) The magnetic bearing of a line in 2010 was found to be S 45° W, when the declination was 1°15' W. Calculate magnetic bearing of the same line if the declination now is 2°25' E.

- b) Define: Magnetic dip and Declination.

(6+4)

4. The following bearings were taken in running a traverse ABCD:

Line	R.B.
AB	N 50°20' E
BC	S 51°40' E
CD	S 20°30' W
DA	N 59°20' W

Calculate the interior angles of traverse ABCD. Apply the usual check.

(10)

5. a) Why the graduations in prismatic compass are inverted and started from South?
 b) What are the temporary adjustments of a Theodolite? (4+6)
 OR
6. a) State the properties of Contours.
 b) Explain Closing error? How it is corrected by Bowditch's rule? (6+4)

SECTION C
(ANSWER 7 and 8 OR 7 and 9)

7. a) What are the Duties of a Mine Surveyor?
 b) Explain the various Classifications of Error.
 c) Calculate the amount and direction of true dip from the following information:
- | Mine roadways | Bearing | Inclination | |
|---------------|---------|----------------|---------|
| AB | S 40° E | Dipping 1 in 5 | |
| AC | N 50° E | Dipping 1 in 8 | (8+6+6) |

8. a) Discuss general features of ANY TWO types of plan used in Underground Mine.
 b) The following data observed for a traverse ABCDE are as follows:
- | Line | Azimuth | Horiz. Length (m) | Gradient | |
|------|---------|-------------------|--------------|--|
| AB | 175° | 150 | 1 in 5 dip | |
| BC | 85° | 306 | Level | |
| CD | 45° | 135 | 1 in 8 rise | |
| DE | 305° | 345 | 1 in 10 rise | |
- Determine the bearing, length and the gradient of the closing line EA. (10+10)

OR

9. a) What are the general requirements of Plans and Sections?
 b) Draw a diagram and show/explain different element of a simple curve.
 c) The following values are observed for angles A, B, C with condition: $A + B = C$.
 $\angle A = 15^\circ 10' 32.2''$ $\angle B = 30^\circ 32' 18.8''$ $\angle C = 45^\circ 42' 53.6''$
- Determine the most probable values of the angles A, B and C. (8+8+6)

