# 22377

# 12425 3 Hours / 70 Marks

Seat No.

# *Instructions* : (1) All Questions are *compulsory*.

- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

## 1. Attempt any FIVE of the following :

- (a) Enlist any four components of transit theodolite.
- (b) Enlist any two purposes of mine correlation survey.
- (c) Define two types of curve used in underground haulage track.
- (d) State the principle of EDM.
- (e) State the principle of GPS.
- (f) Enlist the fundamental axis of theodolite.
- (g) Define GIS with its two applications.

## 2. Attempt any THREE of the following :

- (a) Describe in short :
  - (i) Swinging (ii) Transiting
  - (iii) Face left (iv) Face right
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- (b) State the different method of correlation. Explain Weisbach method.
- (c) State the various curve used in underground mines.
- (d) State the construction and use of one second micro optic theodolite.

# 3. Attempt any THREE of the following :

- (a) Explain the temporary adjustment of transit theodolite.
- (b) The co-ordinates of two points P and Q are as follows :

Point	<b>Co-ordinates</b>		
	Ν	Ε	
Р	600	560	
Q	1380	1100	

Calculate the length and bearing of PQ.

- (c) Describe active and passive system in case of remote sensing.
- (d) State the application of remote sensing in mining.

# 4. Attempt any THREE of the following :

- (a) State the application of theodolite and explain any one.
- (b) State the components of EDM and their function.
- (c) State the use of Drone Surveying in mining industry.
- (d) Describe the sources of error in GIS.
- (e) Explain profile survey and contouring with total station.

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# 5. Attempt any TWO of the following :

(a) A theodolite traverse is run from A to G and the deflection angles are as follows :

At station	В	$32^{\circ}$	16' L
At station	С	18°	34' R
At station	D	22°	12' L
At station	E	42°	24' R
At station	F	52°	42' R

Calculate the bearing of remaining sides of the traverse, given that the forward bearing of  $AB = 110^{\circ}$  6'. Check your calculations.

(b) In Weiss quadrilateral angles are measured at two points A and B with the object of determining the azimuth of PO

Azimuth of  $AB = 89^{\circ} 42'$ 

Angle  $PAQ = 39^{\circ} 54'$ Angle  $QAB = 42^{\circ} 19'$ Angle  $PBQ = 41^{\circ} 08'$ Angle  $ABP = 44^{\circ} 24'$ Length of AB = 30 meters

(c) Describe Rankine's method of Tangential Angles.

## 6. Attempt any TWO of the following :

- (a) Two tangent PQ and QR intersect at a point Q at a chainage 200 m. Calculate the following data for circular curve of radius 100 m and deflection angle 40°:
  - (i) Tangent length
  - (ii) Length curve
  - (iii) Length of long chord
  - (iv) Chainages of tangents point :  $T_1$  and  $T_2$
- (b) Give a layout of a small building by using total station.
- (c) Describe the co-planning method of correlation survey for surface and underground workings of a mine.

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