Name:
Enrolment No:

UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End-Semester Examination, December, 2018

Programme Name: B. TECH. IN MINING ENGINEERING **Semester** : III
Course Name : MINE SURVEYING (PEMI 2002) **Time** : 03 hrs
Max. Marks : 100
Instructions: As stated in the sections.

SECTION A: 20 MARKS (ANSWER ALL)

		Marks	CO
Q1. a)	Convert the following bearings to other system: a) 259^0 b) S 35^0 E.	[4]	CO2
b)	What are the Permanent adjustment of a Theodolite?	[4]	CO3
c)	Explain the essential instrumental Qualities of a theodolite.	[4]	CO3
d)	What are differences between Height of Instrument and Rise & Fall method?	[4]	CO4
e)	With examples, discuss the classification of Error in Surveying.	[4]	CO5

SECTION B: 40 MARKS (ANSWER 2, 3, 4 AND EITHER 5 OR 6)

Q2. a)	Illustrae Staff and Ranging rod?	[4]	CO1
b)	A 20 m chain was found to be 10 cm too long after chaining a distance of 1500 m. it was found to be 18 cm too long at the end of days work after a total distance of 3000 m. find the true distance if the chain was correct before measurements.	[6]	
Q3. a)	The following bearings were taken in running a traverse ABCD. Calculate the deflected angle between AB and BC. Line R.B. AB N 50°20' E BC S 51°40' E	[4]	CO2
b)	Show how Magnetic declination vary with time.	[6]	
Q4. a)	Calculate the amount and direction of true dip from the following information: Mine roadways Bearing Inclination AB S 40° W Dipping 1 in 5 AC S 30° E Dipping 1 in 3	[6]	CO4
b)	Two parallel seams separated by 42 m, are dipping 20^0 with horizontal. Calculate the length of drift to connect the seam if a) the drift is level, b) the drift is rising at 1 in 10 towards the dip of the seams.	[4]	
Q5.	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 Measure the bearing, length and the gradient of the closing line EA.	[10]	CO3

	OR		
Q6.	The following data observed for a Theodolite traverse ABCDE are as follows: Line Azimuth Length (m) AB 98°30' 500 BC 30°20' 620 CD 298°30' 468 DE 230°00' ? EA 150°10' ? Determine the missing lengths DE and EA of the traverse.	**[10]**	**CO3**
	SECTION-C: 40 MARKS (ANSWER 7 AND EITHER 8 OR 9)		
Q7. a)	The following values are observed for a triangle ABC: <A = 62°28'16" <B = 56°44'36" <C = 60°46'56" Determine the most probable values of the angles A, B and C.	**[8]**	**CO5**
b)	Define: Most probable value, Root mean square value.	**[4]**	**CO5**
c)	Explain the duties and responsibilities of Mine Surveyor.	**[8]**	**CO6**
Q8. 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.	**[10]**	**CO5**
b)	Discuss the components of ANY TWO plans used in mine.	**[10]**	**CO6**
	OR		
Q9. a)	Explain the different elements of a simple curve in U/G coal mine.	**[10]**	**CO5**
b)	What are the CMRs for requirements of Plans and Sections?	**[10]**	**CO6**

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SECTION A: 20 MARKS (ANSWER ALL)

S. No.	Statement of question	Marks	CO
Q1. a)	Principle of Surveying.	[4]	CO1
b)	What are the cumulative errors in chaning?	[4]	CO1
c)	Define: Magnetic Dip and Declination.	[4]	CO2
d)	Explain Bowditch's rule.	[4]	CO3
e)	What are differences between Height of Instrument and Rise & Fall method?	[4]	CO4

SECTION B: 40 MARKS (ANSWER 2, 3, 4 AND EITHER 5 OR 6)

Q2. a)	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 cm^2, find the true area of the survey on the ground.	[6]	CO1
b)	Why the graduations are started from south and inverted in Prismatic compass?	[4]	CO2
Q3.	The following interior angles were taken in running a traverse ABCDE in <u>clockwise</u> direction: <A= 100°20'; <B= 80°30'; <C= 70°40'; <D= 162°20'; <E= 126°10'. If the Fore Bearing of the line CD = 60°20', find the bearings of all lines.	[10]	CO2
Q4.	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]	CO3
Q5.	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]	CO3

	OR		
Q6. a) b)	Discuss the temporary adjustments of a Theodolite. Explain Repetition method of angle measurement.	**[6+4]**	**CO3**
SECTION-C: 40 MARKS (ANSWER 7 AND EITHER 8 OR 9)			
Q7. a) b) c)	The following staff readings are obtained in a Level survey (in m) - 0.895, 1.645, 2.895, 3.015, 0.955, 0.695, 0.585, 0.250, 1.535, 0.955, 2.135. The instrument was shifted after 4th and 8th readings. Given: RL of 1st station – 100.00 m. calculate the gradient of the line joining 1st and last points if the distance is 500 m. Apply the check. Write the properties of contours. Discuss the general features of **Any Two** plans used in Mines.	 **[8]** **[6]** **[8]**	 **CO4** **CO4** **CO6**
Q8. a) b)	What are different types of curves? Show with a figure, the elements of a simple curve. Explain the general requirements of Plans and Sections?	**[10]** **[10]**	**CO5** **CO6**
	OR		
Q9. a) b)	The following values are observed for angles A, B, C with condition: A + B = C. <A = 15°10’32.2” <B = 30°32’18.8” <C = 45°42’53.6” Determine the most probable values of the angles A, B and C. Write the duties and responsibilities of a Surveyor.	 **[10]** **[10]**	 **CO5** **CO6**