University of Mumbai

Examination 2021 under cluster __ (Lead College: __KJSIEIT____)

Examinations Commencing from 1 June 2021

Program: **Civil Engineering**

Curriculum Scheme: Rev – 2019

Examination: SE Semester IV

Course Code: CEC 403 and Course Name: Surveying

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	A survey is treated as plain survey when the area under consideration is
Option A:	Less than 260 sq. km
Option B:	More than 260 sq. km
Option C:	Less than 300 sq. km
Option D:	More than 300 sq.km
2.	Choose the type of levelling which is conducted by taking only foresights and back sights
Option A:	Cross-sectional levelling
Option B:	Profile leveling
Option C:	Differential leveling
Option D:	Fly leveling
3.	Convert the following RB into WCB: (i) S 36° 30′W (ii) N 40° 15′W
Option A:	(i) 143° 30′ (ii) 139°45′
Option B:	(i) 143° 30′ (ii) 319°45′
Option C:	(i) 216° 30′ (ii) 319°45′
Option D:	(i) 216° 30′ (ii) 139°45′
4.	Contour lines cross each other in case of
Option A:	Ridge line
Option B:	Valley
Option C:	Overhanging cliff
Option D:	Uniform slope
5.	Calculate the latitude and departure for a line AB, given its RB is N65°E and length is 100 m
Option A:	L = + 50.26 m , D = + 86.63 m
Option B:	L = + 42.26 m , D = + 90.63 m
Option C:	L = - 50.26 m , D = - 86.63 m
Option D:	L = - 42.26 m , D = -90.63 m
6.	GPS satellite constellation consist of
Option A:	4 satellites
Option B:	18 satellites

Option C:	24 satellites
Option D:	6 satellites
7.	Given the magnetic bearing of line AB as S 30° 15′ W, calculate its true bearing if the declination is 5°15′ W
Option A:	220°30′
Option B:	205°
Option C:	215°30′
Option D:	200°
8.	The most common method of tacheometry is
Option A:	Movable hair method
Option B:	Subtense bar method
Option C:	Tangential method
Option D:	Fixed hair method
9.	The surface tangential to a level surface is called
Option A:	Vertical surface
Option B:	Mean sea level
Option C:	Horizontal Surface
Option D:	Ground surface
10.	Which method of plane table survey is most suitable for locating the instrument station
Option A:	Resection
Option B:	Intersection
Option C:	Traversing
Option D:	Radiation
11.	Ideal shape of a vertical curve is
Option A:	Circular
Option B:	Parabolic
Option C:	Spiral
Option D:	Elliptical
12.	If the angular measurements are more precise to linear measurements in a traverse, its balancing can be done by
Option A:	Transit rule
Option B:	Bowditch rule
Option C:	Empirical rule
Option D:	Lehman's rule
13.	For an inclined line of sight and staff held vertical, the RL of staff station in depression is given by
Option A:	Height of Instrument +V – central hair reading
Option B:	Height of Instrument +V + central hair reading
Option C:	Height of Instrument -V + central hair reading
Option D:	Height of Instrument -V –central hair reading
14.	Determine the tangent length for a simple curve with radius 300 m and

	intersection angle 144°
Option A:	92.71 m
Option B:	217.96 m
Option C:	97.48 m
Option D:	176.33 m
15.	The distance of the top of a light house from the station of observation is 60 km. Find the height of the lamp above sea level
Option A:	168.25 m
Option B:	224.28 m
Option C:	186.25 m
Option D:	242.28 m
16.	Radius of a one degree curve is
Option A:	1760 m
Option B:	1719 m
Option C:	1419 m
Option D:	1460 m
17.	The process of turning the telescope in the horizontal plane about vertical axis is known as
Option A:	Reversing
Option B:	Swinging
Option C:	Transiting
Option D:	Plunging
18.	Calculate the volume of an excavation made for a reservoir whose width is 11 m, length is 40 m and depth is 1.25 m. The side slopes are 1.5:1 and the top to be flush with the ground which is level in the vicinity.
Option A:	311.8 cu. M
Option B:	321.8 cu. M
Option C:	331.8 cu. M
Option D:	301.8 cu. M
19.	In case of a well-conditioned triangle, no internal angle should be less than
Option A:	60°
Option B:	50°
Option C:	30°
Option D:	20°
20.	Calculate the tacheometric constants given the focal length of the object glass is 20 cm and the distance of the trunnion axis is 10 cm and distance between two stadia hairs is 0.6 mm.
Option A:	Multiplication Constant = 166.67, Additive constant = 0.3 m
Option B:	Multiplication Constant = 133.33, Additive constant = 0.26 m
Option C:	Multiplication Constant = 166.67, Additive constant = 0.26 m
Option D:	Multiplication Constant = 133.33, Additive constant = 0.3 m

Subjective Questions

Q2	**Solve any Four out of Six** **(4 x 5 = 20 marks)**
A	Draw a neat sketch of simple circular curve illustrating all its elements
B	Define contour. Explain its characteristics
C	Write a short note on the application of GPS in surveying.
D	Differentiate between independent and consecutive co-ordinates
E	Explain the procedure for carrying out two pint problem in plane table survey
F	Differentiate between surveyor's compass and prismatic compass

Q3.

A **Solve any One** **10 marks**

i. The following consecutive readings were taken with a level and a 4 m levelling staff on a continuously sloping ground at common interval of 30 m

0.855 (on A), 1.545, 2.335, 3.115, 3.825, 0.455, 1.380, 2.055, 2.855, 3.455, 0.585, 1.015, 1.850, 2.755, 3.845 (on B)

The RL of A was 380.500 m. Make a level book and apply usual checks. Determine the gradient of the line AB.

ii. The following bearings were taken in running a closed compass traverse:

Line	FB	BB
AB	48° 25′	230° 00′
BC	177° 45′	356° 00′
CD	104° 15′	284° 55′
DE	165° 15′	345° 15′
EA	259° 30′	79° 90′

(i) State which stations are affected by local attraction
(ii) Determine the corrected bearings
(iii) Calculate the true bearings if the declination was 1° 30′ W

B **Solve any One** **10 marks**

i. Tabulate the necessary data to set out a right handed simple circular curve of 600 m radius to connect two straights intersecting at a chainage of 3605 m by deflection angle method, the angle of intersection being 155° and peg interval 30 m

ii. A fixed hair tacheometer fitted with an anallatic lens and having its constant 100, was set up at station C and the following observations were made:

Station sighted	**Bearing**	**Stadia reading**	**Axial hair reading**	**Vertical angles**
A	320° 40'	0.915, 2.585	1.750	+10° 36'
B	50° 40'	0.765, 3.655	2.210	+8° 54'

Calculate the gradient from point A to point B