



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

CIVIL ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	SURVEYING & GEOMATICS
Course Code	:	ACEB01
Program	:	B.Tech
Semester	:	III
Branch	:	Civil Engineering
Section	:	A & B
Academic Year	:	2019 - 2020
Course Faculty	:	Dr. K Shruthi, Assistant Professor Mr. B Suresh, Assistant Professor

COURSE OBJECTIVES:

The course should enable the students to:	
I	Describe the function of surveying in civil engineering construction.
II	Work with survey observations, and perform calculations.
III	Identify and calculate the errors in measurements and to develop corrected values for differential level circuits, horizontal distances and angles for open or closed-loop traverses.
IV	Operate an automatic level to perform differential and profile leveling; properly record notes mathematically reduce and check levelling measurements

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
MODULE-I						
1	What is meant by surveying?	Surveying is the science and art of determining the relative positions of points above, on, or beneath the earth's surface and locating the points in the field.	Remember	CO 1	CLO 1	ACEB01.01
2	What are the objectives of surveying?	The primary object of survey is the preparation of plan of estate or buildings roads, railways, pipelines, canals, etc. Or to measure area of field, state, nation.	Understand	CO 1	CLO 1	ACEB01.01
3	What is meant by plane surveying?	The shape of the earth is spherical. Thus the surface is obviously curved. But in plane surveying the curvature of earth is not taken into account.	Remember	CO 1	CLO 3	ACEB01.03
4	What is meant by geodetic surveying?	In geodetic surveying the curvature of the earth is taken into consideration. It is extended over a large area greater than 250 sq.km.	Remember	CO 1	CLO 3	ACEB01.03

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5	What so you understand by leveling?	Leveling is the determination of the elevation of a point or difference between points referenced to some datum.	Understand	CO 1	CLO 4	ACEB01.04
7	What are the applications of surveying?	To prepare a topographical map this shows the hills, valley, rivers, villages, town, etc, of a country. To prepare a cadastral map showing the boundaries of fields houses, and other properties.	Understand	CO 1	CLO 2	ACEB01.02
8	What so you understand by benchmark?	Benchmark is a relatively permanent object bearing a marked point whose elevation above or below an adopted datum.	Understand	CO 1	CLO 1	ACEB01.01
9	What are the different errors in leveling?	Inclination due to maladjustment of instrument, Changes in scale of rod due to temperature, Rod not held plumb.	Understand	CO 1	CLO 1	ACEB01.01
10	What do you understand by precise leveling?	Precise levelling is a particularly accurate method of differential levelling which uses highly accurate levels and with a more rigorous observing procedure than general engineering levelling. It aims to achieve high orders of accuracy such as 1 mm per 1 km traverse.	Understand	CO 1	CLO 1	ACEB01.01
11	What do you understand by reciprocal leveling?	In reciprocal levelling, the level is set up on both bank of the river or valley and two sets of staff reading is taken by holding the staff on both banks in this case it is found that error is completely eliminated and true difference of level is equal to the mean of the two apparent difference of level.	Understand	CO 1	CLO 3	ACEB01.03
12	What do you mean by auto level?	The automatic level employs a gravity-referenced prism or mirror compensator to orient the line of sight (line of collimation) automatically. The instrument is quickly levelled when a circular spirit level is used.	Remember	CO 1	CLO 3	ACEB01.03
13	What do you mean by tilting level?	Tilting level consists of a telescope attached with a level tube which can be tilted within few degrees in vertical plane by a tilting screw.	Remember	CO 1	CLO 5	ACEB01.05
14	What do you understand by differential leveling?	Differential levelling is the term applied to any method of measuring directly with a graduated staff the difference in elevation between two or more points.	Remember	CO 1	CLO 5	ACEB01.05

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15	Why there is need for performing leveling?	For execution of Engineering Projects it is very necessary to determine elevations of different points along the alignment of proposed project.	Understand	CO 1	CLO 4	ACEB01.04
MODULE-II						
1	What are the methods of setting out simple circular curve?	Based on the instruments used in setting out the curves on the ground there are two methods: Linear method and Angular method	Remember	CO 2	CLO 7	ACEB01.07
2	What are the linear methods of setting out simple circular curve?	Main linear methods are: 1) By offsets from the long chord. 2) By successive bisection of arcs and By offsets from the tangents.	Remember	CO 2	CLO 7	ACEB01.07
3	What are the angular Methods of setting out simple circular curve?	The Angular methods are: 1) Rankine method of tangential angles 2) Two theodolite method 3) Tacheometric method	Remember	CO 2	CLO 7	ACEB01.07
4	What do you mean by curve?	Degree of curvature is defined as angle in degrees subtended by an arc of standard length. This definition is generally used in highway practice. The length of standard arc used in FPS was 100 ft.	Remember	CO 2	CLO 6	ACEB01.06
5	What are the problems that may arise in setting curves?	The following two special problems may arise in setting curves-Passing the curve through a given point and Setting curve tangential to three lines.	Understand	CO 2	CLO 6	ACEB01.06
6	What do you mean by transition curve?	A non-circular curve of varying radius introduced between a straight and a circular curve for the purpose of giving easy changes of direction of a route is called a transition or easement curve.	Remember	CO 2	CLO 9	ACEB01.09
7	What are the advantages of providing a transition curve at each end of a circular curve?	The transition from the tangent to the circular curve and from the circular curve to the tangent is made gradual. It provides satisfactory means of obtaining a gradual increase of super-elevation from zero on the tangent to the required full amount on the main circular curve.	Understand	CO 2	CLO 9	ACEB01.09
8	What are the conditions to be fulfilled by the transition curve?	It should meet the tangent line as well as the circular curve tangentially. The rate of increase of curvature along the transition curve should be the same as that of increase of super-elevation.	Understand	CO 2	CLO 9	ACEB01.09

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9	What are the types of transition curves?	There are three types of transition curves in common use: cubic parabola, cubical spiral, and lemniscate	Remember	CO 2	CLO 9	ACEB01.09
10	Differentiate between horizontal and vertical curves?	Curves provided in the horizontal plane to have the gradual change in direction are known as horizontal curves, whereas those provided in the vertical plane to obtain the gradual change in grade are known as vertical curves.	Remember	CO 2	CLO 9	ACEB01.09
11	What is the need for providing curves?	Curves are regular bends provided in the lines of communication like roads, railways etc. and also in canals to bring about the gradual change of direction. They are also used in the vertical plane at all changes of grade to avoid the abrupt change of grade at the apex.	Understand	CO 2	CLO 6	ACEB01.06
12	What do you understand by reverse curve?	A reverse or serpentine curve is made up of two arcs having equal or different radii bending in opposite directions with a common tangent at their junction. Their centres lie of opposite sides of the curve.	Understand	CO 2	CLO 8	ACEB01.08
13	When are reverse curves used?	Reverse curves are used when the straights arc parallel or intersect at a very small angle. They are commonly used in railway sidings and sometimes on railway tracks and roads meant for low speeds. They should be avoided as far as possible on main railway lines and highways where speeds are necessarily high.	Understand	CO 2	CLO 8	ACEB01.08
14	How is the curve designated?	A curve may be designated either by the radius or by the angle subtended at the centre by a chord of particular length.	Understand	CO 2	CLO 8	ACEB01.08
15	What is meant by degree of curve?	A curve is designated by the angle (in degrees) subtended at the centre by a chord of 30 metres (100 ft.) length. This angle is called the degree of the curve (D).	Understand	CO 2	CLO 8	ACEB01.08
MODULE-III						
1	What is meant by electronic theodolite?	The advance of technology and miniaturization of electronic components enabled the building of theodolites that measure angles electronically, called Electronic Theodolite	Remember	CO 3	CLO 10	ACEB01.10

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2	What is meant by total station?	Combination of an electronic theodolite and electronic distance meter, and software running on an external laptop computer known as a data collector is called Total Station	Remember	CO 3	CLO 11	ACEB01.11
3	What do you understand by Electronic Distance meter?	Electronic Distance meter is the distance determined by emitting and receiving multiple frequencies, and determining the integer number of wavelengths to the target for each frequency	Understand	CO 3	CLO 10	ACEB01.10
4	What do you understand by Global Positioning System?	GPS, which stands for Global Positioning System, is the only system today able to show you your exact position on the Earth anytime, in any weather, anywhere.	Understand	CO 3	CLO 14	ACEB01.14
5	What is meant by Remote Elevated Measurement (REM)?	An REM is a function used to measure the height to a point where a target cannot be directly installed such as power lines, overhead cables etc.	Remember	CO 3	CLO 10	ACEB01.10
6	What is the purpose of total station?	A Total station integrates the functions of a Electronic theodolite for measuring angles, an EDM for measuring distances, digital data and a data recorder	Understand	CO 3	CLO 12	ACEB01.12
7	How is the distance measured in Electronic Distance meter?	Measurement of distance is done by a modulated microwave or infrared carrier signal in a Electronic Distance meter.	Understand	CO 3	CLO 11	ACEB01.11
8	What is meant by distomat?	Distomat is a very small, compact EDM, particularly useful in building construction and other Civil Engineering works, where distance measurements are less than 500 m.	Remember	CO 3	CLO 11	ACEB01.11
9	What are the benefits of total station?	Total solution for surveying work, Most accurate and user friendly, Gives position of a point (x, y and z) w. r. t. known point (base point), Compatibility with computers	Understand	CO 3	CLO 12	ACEB01.12
10	What are the different types of Electronic Distance Measurement instruments?	Different types of Electronic Distance measurement instruments are: Infrared wave instruments. Light wave instruments. Microwave instruments.	Remember	CO 3	CLO 10	ACEB01.10
11	What do you mean by automatic level?	An automatic level is a special leveling instrument used in surveying which contains an optical compensator which maintains line of sight or line of collimation even though instrument is slightly tilted.	Remember	CO 3	CLO 14	ACEB01.14

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12	What is the purpose of GPS in surveying?	The user needs a GPS receiver to locate the position of any point on ground. The receiver processes the signals received from the satellite and compute the position (latitude and longitude) and elevation of a point with reference to datum.	Understand	CO 3	CLO 15	ACEB01.15
13	What are the various functions of total station?	Total Station can perform the following functions: Distance measurement, Angular measurement, Data processing, Digital display of point details.	Understand	CO 3	CLO 13	ACEB01.13
14	What is the purpose of infrared wave instruments?	Infrared wave instruments measure distances by using amplitude modulated infrared waves. At the end of the line, prisms mounted on target are used to reflect the waves.	Understand	CO 3	CLO 14	ACEB01.14
15	What are the advantages of infrared wave instruments?	Infrared wave instruments are light and economical and can be mounted on theodolites for angular measurements. The range of such an instrument will be 3 km and the accuracy achieved is ± 10 mm.	Remember	CO 3	CLO 14	ACEB01.14

MODULE-IV

1	What do you mean by Photogrammetry?	Photogrammetry can be defined as the science of making reliable measurements by photographs or digital photo imagery to locate features on or above the surface of the earth.	Remember	CO 4	CLO 16	ACEB01.16
2	What are the various advantages of Photogrammetry surveying?	Terrain data and mapping features can be extracted from stereo image models with little effort and at a low cost. Large area mapping and digital terrain models can be accomplished quicker and at a lower cost when compared to ground survey methods.	Remember	CO 4	CLO 16	ACEB01.16
3	What are the various disadvantages of Photogrammetry surveying?	Seasonal weather patterns that produce increased wind and cloud cover may hamper the ability to perform the mission. It may be difficult or impossible to collect measurements in areas with dark shadows, dense vegetation, snow, water, or overhanging features.	Remember	CO 4	CLO 16	ACEB01.16
4	What is the principle of Photogrammetry	The principal point of each photograph is used as a fixed station and rays are drawn to get points of intersections very similar to those used in plane table.	Understand	CO 4	CLO 16	ACEB01.16

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5	What are the types of photogrammetry?	Types of photogrammetry are: Terrestrial Photographs Aerial Photographs	Remember	CO 4	CLO 19	ACEB01.19
6	What is meant by terrestrial photographs?	Photographs taken from camera station at a fixed position on or near the ground is known as Terrestrial Photographs. The photographs are taken by means of a photo theodolite which is combination of a camera and a theodolite.	Remember	CO 4	CLO 19	ACEB01.19
7	What is meant by aerial photographs?	Photographs taken from a Aerial camera mounted on a aerial vehicle. Used for various purpose, mainly information extraction on the ground surface	Remember	CO 4	CLO 17	ACEB01.17
8	What are the requirements of aerial camera?	Fast Lens High speed & sufficient shutter High speed emulsion for the film A Magazine to hold large rolls of film	Understand	CO 4	CLO 17	ACEB01.17
9	What is meant by tilt displacement?	Tilt displacement is defined as the difference between the distance of the image of a point on the tilted photograph from the isocentre and the distance of the image of the same point on the photograph from the isocentre if there had been no tilt.	Remember	CO 4	CLO 18	ACEB01.18
10	What is meant by Exposure (or air) station?	Exposure (or air) station is the exact position of the front nodal point of the lens in the air at the instant of exposure.	Remember	CO 4	CLO 20	ACEB01.20
11	What is meant by Flying height?	Flying height is the elevation of the air station above the mean sea level is known as flying height of the aircraft.	Remember	CO 4	CLO 20	ACEB01.20
12	What is meant by Principal Point	Principal Point is the point where a perpendicular dropped from the front nodal point strikes the photographs	Remember	CO 4	CLO 20	ACEB01.20
13	What is meant by focal length?	Focal length is the perpendicular distance from the centre of the camera lens to either the picture plane or the camera plate.	Remember	CO 4	CLO 20	ACEB01.20
14	What do you mean by horizontal point?	The point of intersection of the principal line and the horizontal line through the perspective centre O is known as horizontal point.	Remember	CO 4	CLO 20	ACEB01.20
15	What do you mean by tilt?	The deviation of a plate from the horizontal plane at the time of exposure.	Remember	CO 4	CLO 18	ACEB01.18

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MODULE-V						
1	What is meant by remote sensing?	Remote sensing is an art and science of obtaining information about an object or feature without physically coming in contact with that object or feature. Humans apply remote sensing in their day-to-day business, through vision, hearing and sense of smell.	Remember	CO 5	CLO 21	ACEB01.21
2	What are the applications of remote sensing?	It finds extensive applications in civil engineering including watershed studies, hydrological states and fluxes simulation, hydrological modelling, disaster management services such as flood and drought warning and monitoring etc.	Understand	CO 5	CLO 21	ACEB01.21
3	What do you mean by electromagnetic radiation?	Electromagnetic radiation (EMR) is the energy propagated in the form of an advancing interaction between electric and magnetic fields. It travels with the velocity of light. Visible light, ultraviolet rays, infrared rays, heat, radio waves, X-rays all are different forms of electromagnetic energy.	Remember	CO 5	CLO 22	ACEB01.22
4	What are the advantages of remote sensing?	Advantages of remote sensing are: a) Provides data of large areas b) Provides data of very remote and inaccessible regions c) Able to obtain imagery of any area over a continuous period of time	Remember	CO 5	CLO 21	ACEB01.21
5	What are the disadvantages of remote sensing?	Disadvantages of remote sensing are: a) The interpretation of imagery requires a certain skill level 9 b) Needs cross verification with ground (field) survey data c) Data from multiple sources may create confusion	Remember	CO 5	CLO 21	ACEB01.21
6	What is meant by electromagnetic radiation (EMR) spectrum?	Distribution of the continuum of radiant energy can be plotted as a function of wavelength (or frequency) and is known as the electromagnetic radiation (EMR) spectrum.	Remember	CO 5	CLO 22	ACEB01.22
7	What is meant by Ground level remote sensing?	Ground level remote sensing, Ground level remote sensors are very close to the ground. They are basically used to develop and calibrate sensors for different features on the Earth's surface.	Remember	CO 5	CLO 23	ACEB01.23

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8	What is meant by airborne remote sensing?	In airborne remote sensing, downward or sideward looking sensors mounted on aircrafts are used to obtain images of the earth's surface. Very high spatial resolution images (20 cm or less) can be obtained through this.	Remember	CO 5	CLO 23	ACEB01.23
9	What is meant by space-borne remote sensing?	In space-borne remote sensing, sensors mounted on space shuttles or satellites orbiting the Earth are used. There are several remote sensing satellites (Geostationary and Polar orbiting) providing imagery for research and operational applications.	Remember	CO 5	CLO 23	ACEB01.23
10	What is meant by electromagnetic energy?	Electromagnetic (EM) energy includes all energy moving in a harmonic sinusoidal wave pattern with a velocity equal to that of light. Harmonic pattern means waves occurring at frequent intervals of time.	Remember	CO 5	CLO 22	ACEB01.22
11	What do you mean by scattering?	Atmospheric scattering is the process by which small particles in the atmosphere diffuse a portion of the incident radiation in all directions. There is no energy transformation while scattering. But the spatial distribution of the energy is altered during scattering.	Remember	CO 5	CLO 22	ACEB01.22
12	What are the different types of scattering?	There are three different types of scattering: 1. Rayleigh scattering 2. Mie scattering 3. Non-selective scattering	Understand	CO 5	CLO 22	ACEB01.22
13	What is the purpose of sensors?	Solar energy reflected by the targets at specific wavelength bands are recorded using sensors on board air-borne or space borne platforms.	Understand	CO 5	CLO 23	ACEB01.23
14	What do you mean by absorption?	Absorption is the process in which incident energy is retained by particles in the atmosphere at a given wavelength.	Understand	CO 5	CLO 24	ACEB01.24
15	What is meant by reflection?	Reflection is the process in which the incident energy is redirected in such a way that the angle of incidence is equal to the angle of reflection. The reflected radiation leaves the surface at the same angle as it approached.	Remember	CO 5	CLO 24	ACEB01.24

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