

II B. Tech I Semester Supplementary Examinations, October/November - 2020**SURVEYING**

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **FOUR** Questions from **Part-B**
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PART-A

- 1 a) Write the classifications of surveying? (2M)
 b) Define the true bearing and magnetic bearing. (2M)
 c) Define the following terms Benchmark, Parallax. (2M)
 d) Write the instrumental errors in stadia surveying. (3M)
 e) Write about total stations. (3M)
 f) Derive the expression for trapezoidal formula for volume (2M)

PART-B

- 2 Classify and explain in detail about the method of surveying based upon the instruments used. (14M)
- 3 Two points A and D are connected by a traverse survey ABCD and the following records are obtained (14M)
 AB = 219m; BC = 170.5m; CD = 245.75m
 Angle ABC = $118^{\circ}15'$; Angle BCD = $180^{\circ}40'$.
 Assuming that AB is in meridian, determine:
 i) The latitude and departure of D relative to A.
 ii) The length AD.
 iii) The angle BAD.
- 4 The following staff readings were observed successively with level, the instrument having been moved forward after the second, fourth and eighth readings:
 0.875, 1.235, 2.310, 1.385, 2.930, 3.125, 4.125, 0.120, 1.875, 2.030, 3.765.
 The first reading was taken with the staff held upon a benchmark of elevation 132.135. Enter the readings in level book-form and reduce the levels. Apply the usual checks. Find also the difference in level between the first and the last points (14M)
- 5 An ordinary theodolite is to be converted into an anallactic tacheometer with a multiplier of 100 by an insertion of a new glass stadia diaphragm and an additional convex lens. Focal length of object glass is 15cm, fixed at a distance of 10cm from the trunnion axis. A focusing slide carries the eye-piece. If a suitable lens of 10 cm focal length is available for the anallactic lens, Calculate the fixed distance at which this must be placed from the objective and the spacing of the stadia hairs on the diaphragm. (14M)

- 6 What are the common difficulties in setting out simple curves? Describe briefly the methods employed in overcoming them. (14M)
- 7 The following notes refer to three level cross-sections at two sections 50 meters apart.

Station	Cross-section		
A	1.7/7.7	2.8/0	4.6/10.6
B	2.9/8.9	3.7/0	6.9/12.9

The width of cutting at the formation level is 10m. Calculate the volume of cutting between the two stations. (14M)

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PART -A

1. a) List the reasons for incorrect length of chain? (2 M)
- b) List the fundamental lines of Dumpy Level? (2M)
- c) Define the term “contour”? (2M)
- d) Define the terms : i)Transiting ii)Swinging face left iii)Face Right (3 M)
- e) Define the terms “Compound Curve” (3 M)
- f) Write the formula for Simpson’s rule? (2M)

PART -B

2. a) A 20 m chain was found to be 15 cm too long after chaining a distance of 1600 m. It was found to be 30 cm too long at the end of day’s work after chaining a total distance of 3200 m. Determine the correct distance if the chain was correct before the commencement of the work. (7M)
- b) State the reasons for incorrect length of Chain? (7M)
3. a) Find the angles between the lines AB and AC, If their respective bearings are $35^{\circ} 40'$ and $142^{\circ} 20'$? (7M)
- b) Differentiate between (7M)
 - i)True meridian and Magnetic Meridian
 - ii) Declination and Dip
4. a) Describe the profile leveling method? (7M)
- b) Find out the missing (?) F.S and B.S values in table of a Leveling field book given . (7M)

Station	B.S	I.S	F.S	Rise	Fall	Remarks
1.	4.550					Starting Point
2.	2.125		?		0.750	Change Point
3.		2.225				
4.	?		1.975			Change Point
5.		2.445		1.500		

5. a) How to calculate the area of closed traverse from the rectangular co - ordinates? (7M)
- b) State the Principle of tachometric Surveying? (7M)

6. a) Two straights of a circular curve meet at an intersection angle of 65° and the length of the long chord is 130 m. Find out the Tangent length, apex distance, and rise in meter of curve? (7M)
- b) Explain the method of setting out curve by Chord and Angle method? (7M)
7. a) Explain the Double Meridian Distance (D.M.D) method for the computation of area of a closed traverse? (7M)
- b) The following perpendicular offsets were taken at 5 m intervals from a traverse line to an irregular boundary line (7M)
- 2.10; 3.15; 4.50; 3.60; 4.58; 7.85; 6.45; 4.65; 3.14 m.**
- Compute the area enclosed between the traverse line and the irregular boundary from the first to the last offset.

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PART -A

1. a) What do you mean by plane surveying? (2 M)
- b) Define the term ‘Magnetic declination’ (2M)
- c) Define the term “Reduce Level” (2M)
- d) State the rules for distribution of error of closure? (3 M)
- e) Define the term “Super elevation”? (3 M)
- f) List the methods of calculation for volume of barrow pits? (2M)

PART -B

2. a) List the instruments for Direct measurement of Distances? (7M)
- b) Give the broad classification of Surveying? (7M)
3. a) In a triangle ABC, The bearings of the sides AB, BC ,and CA are 60^0 , 130^0 and 270^0 respectively. Calculate the Interior angles A,B, and C in degrees? (7M)
- b) Find out the missing figures and complete the level book page. Apply usual arithmetic check. (7M)

B.S	I.S	F.S	H.I	R.L	Remarks
4.390			×	×	Point1
	×			192.00	Point2
3.910		6.520	×	×	Point3
	5.390			191.620	B.M
	4.730			×	Point4
	×			203.300	Point5 staff inverted
4.330		×	×	×	Point 6
		2.990		194.830	Point 7

4. a) Discuss the characteristics of contours, give suitable sketches. (7M)
- b) Describe the method of Reciprocal leveling. (7M)

5. a) The following fore and back bearings were observed in traversing with a compass

Line	F.B	B.B
AB	S45°00'E	N45°00'W
BC	N60°30'E	S60°30'W
CD	N5°30'E	S5°30'W
DE	N65°30'W	S65°30'E
EA	S40°00'W	N40°00'E

Compute the included angles of the traverse

- b) Explain the procedure of running a traverse by the method of included angles. (7M)
6. Write short notes on the following (14M)
- Elements of a compound curve
 - Reverse Curve
7. a) The following perpendicular offsets were taken at 5 m intervals from a traverse line to an irregular boundary line (7M)
- 2.10; 3.15; 4.50; 3.60; 4.58; 7.85; 6.45; 4.65; 3.14 m.**
- Compute the area enclosed between the traverse line and the irregular boundary from the first to the last offset.
- b) Calculate the side widths and cross-sectional areas of cut and fill in a side hill (7M)
- Section having the following dimensions.
- Centre height in cut :1m
 Formation width :22m
 Side slope in cut :1 to 1
 Side slope in fill :2 to 1
 Transverse slope : 5.5 to 1

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PART -A

1. a) State the Principles of Surveying (2 M)
- b) Define Azimuth (2M)
- c) Define the term Levelling? (2M)
- d) List the method of traversing with theodolite? (3 M)
- e) Classify the Curves? (3 M)
- f) Write the formula for area of Triangle (2M)

PART -B

2. a) Discuss briefly the classification of surveying based on purpose and Instruments.? (7M)
- b) A 30m tape standardized in catenary as 29.990m at 100N is used in the field with a tension of 80 N in catenary. Calculate the Sag correction if the mass of the tape is 0.33 kg per m. (7M)
3. a) Discuss basic objective of survey and Convert the following W.C.Bs into Q.Bs (7M)
 i) $54^0-30'$ ii) 132^0 iii) $243^0-30'$ iv) 315^0-00
- b) Explain the effects of curvature and refraction in Levelling? (7M)
4. a) What is a contour line? What is the importance of contour maps in Civil engineering works? (7M)
- b) Following are the staff readings taken with a dumpy level. Find the reduced levels of points by line of collimation method if the R.L bench mark is 100.00m (7M)

STATION	B.S	I.S	F.S
P	1.220		
A		1.750	
B		1.620	
Q	1.110		1.545
C		1.990	
D		1.670	
E			1.550

5. a) State the Bowditch rule and transit rules of balancing. (7M)
- b) Calculate latitudes ,departures and closing error for the following traverse, (7M)
and adjust using Bowditch's rule.

Line	Length(m)	WCB
AB	89.31	$45^{\circ} 10'$
BC	219.76	$72^{\circ} 05'$
CD	151.18	$161^{\circ} 52'$
DE	159.10	$228^{\circ} 43'$
EA	232.26	$300^{\circ} 42'$

6. a) Write short notes on the following (7M)
i) Transition Curve
ii) Super elevation.
- b) Two tangents meet at chainage 1023 metres the deflection angle being 36° .A (7M)
Circular curve of radius 300m is to be introduced in between the two tangents
Calculate the
following
i) Tangent Length
ii) Length of Circular curve
iii) Chainages of the tangent points.
7. a) The following perpendicular offsets were taken from a chain line to an (7M)
irregular boundary.
- | | | | | | | |
|-----------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Chainage | 0 | 8 | 20 | 35 | 47 | 60m |
| Offsets | 14.5 | 24.5 | 30.8 | 27.4 | 28.4 | 18.4m |
- Compute the area between the chain line ,the boundary and the end offsets.
Determine the volume of cut and fill from chainage 0 to 100 m from the
three X-sections at chainage 0,45.0, and 100.0 m.
- b) State the determination of capacity of reservoir? (7M)

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PART -A

1. a) Define the term 'Surveying' (2 M)
- b) State the uses of Compass? (2M)
- c) Define the term "Bench Mark"? (2M)
- d) Define terms "Contour interval and "Horizontal equivalent" of contour? (3 M)
- e) Name different methods of Curve ranging. (3 M)
- f) State the mid-ordinate rule of area calculation? (2M)

PART -B

2. a) What are different methods of making linear measurements? Describe briefly (7M)
- b) The length of a line measured with 20 m chain was found to be 372 metres. The true length of the line was known to be 371 metres. Find the error in the chain? (7M)

3. a) The following are the observed fore end back bearings of a closed compass traverse ABC. (7M)

Calculate the include angles

<u>Line</u>	<u>F.B</u>	<u>B.B</u>
AB	40°	220°
BC	110°	290°
CA	275°	95°

- b) Explain the terms "Local attraction" and "Magnetic declination" (7M)
4. a) Explain the principle of leveling? (7M)
- b) Define the terms "Contour Interval" and "Horizontal Equivalent of Contour"? (7M)
5. a) Describe the Transit Vernier theodolite with sketch. (7M)
- b) The lengths and bearings of the four lines of a closed traverse ABCDE. (7M)

Determine the length and bearing of the fifth line EA.

Line	Length	Bearing
AB	194.1m	85 ⁰
BC	201.2m	15 ⁰
CD	165.4m	285 ⁰ 30'
DE	172.6m	195 ⁰ 30 ⁰
EA	?	?

6. a) What is a “Compound Curve “? Describe in a few sentences, how this curve differs from other ones. (7M)
- b) A Circular curve has been set off touching the line AB and BC at points A and C respectively. If the angles CBA is 156° and the minimum distance from point B to the curve is 20 metres, Calculate i) the length of the lines AB and BC and (ii) Area bounded by the lines AB and BC and the Curve. (7M)
7. a) The area with in the contour lines at the site of Abandoned Quarry used as the water reservoir and the face of the proposed dam are as follows; (7M)

Contour in Metres	350	352	354	356	358	360	362
Area in Sq.M	300	10,500	76000	1,45000	270000	4,15000	4,70000

Taking 350 as bottom level of reservoir and 362 as the F.R.L. Find the volume of water in the reservoir in cubic metres using Trapezoidal rule.

- b) Strata the various methods for computation of areas along irregular boundaries? (7M)

II B. Tech I Semester Supplementary Examinations, May - 2018
SURVEYING
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **FOUR** Questions from **Part-B**

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**PART-A**

- 1 a) List the accessories of plane table.
- b) Define latitude and departure.
- c) List the leveling instruments
- d) What are 'face left' and 'face right' observations? Why is it necessary to take both face observations?
- e) Write in detail about GPS.
- f) How do you determine the earth work for a borrow pit?

**PART-B**

- 2 a) Compare the advantages and disadvantages of plane table surveying with those of chain surveying.
- b) State three-point problem plane tabling and describe its solution by trial method giving the rules which you will follow in estimating position of the point sought
- 3 a) The following bearings are taken on a closed compass traverse.

| Line | F.B                     | B.B                     |
|------|-------------------------|-------------------------|
| AB   | S 37 <sup>0</sup> 30' E | N 37 <sup>0</sup> 30' W |
| BC   | S 43 <sup>0</sup> 15' W | N 44 <sup>0</sup> 15' E |
| CD   | N 73 <sup>0</sup> 00' W | S 72 <sup>0</sup> 15' E |
| DE   | N 12 <sup>0</sup> 45' E | S 13 <sup>0</sup> 15' W |
| EA   | N 60 <sup>0</sup> 00' E | S 59 <sup>0</sup> 00' W |

Compute the interior angles and correct them for observational errors. Assuming the observed bearing of the line AB to be correct, adjust the bearing of the remaining sides.

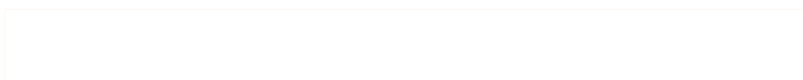
- 4 a) What are the temporary adjustments of a leveling
- b) What are the indirect methods of locating a contour? Write about any one method.
- 5 a) Write the temporary adjustments of a transit theodolite
- b) Write the permanent adjustments of a theodolite
- 6 Two straights of a proposed road deflect through an angle of 1200. Originally, they were to be connected by a curve of 520meters radius. However, due to the revision of the scheme, the deflection angle is to be increased to 1320. Calculate the suitable radius of the curve such that the original starting point of the curve (P.C.) does not change

Code No: R1621015

1 R16

SET - 1

- 7 The following perpendicular offsets were taken at 10m intervals from a survey line to an irregular boundary line:  
3.25, 5.60, 4.20, 6.65, 8.75, 6.20, 3.25, 4.20, 5.65  
Calculate the area enclosed between the survey line, the irregular boundary line and the first and last offsets by Simpsons method.



**II B. Tech I Semester Supplementary Examinations, May - 2018**  
**ELECTROMAGNETIC FIELDS**  
 (Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

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 2. Answer **ALL** the question in **Part-A**  
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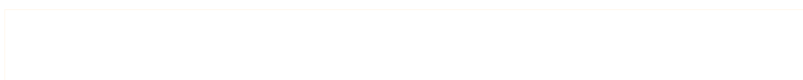
**PART -A**

1. a) What is the concept of electric field and write down expression for the electric field due to a point charge
- b) Derive the expression for energy stored in a static electric field
- c) State the Biot-Savart's law
- d) Define the magnetic dipole and dipole moment
- e) Define self and mutual inductance
- f) States the Poynting Theorem

**PART -B**

2. a) State and explain Coulomb's law. Give its limitations.
- b) Four equal charges  $Q_1 = Q_2 = Q_3 = 2 \mu\text{C}$  are placed on the corners of a square,  $Q_1$  is at (0, 0, 0),  $Q_2$  is at (2, 0, 0),  $Q_3$  is at (0, 1, 0) and  $Q_4$  is at (2, 2, 0). Calculate the net force on  $Q_4$  which is equal to  $5 \mu\text{C}$ .
3. a) Define polarization? Explain different types of polarization?
- b) Find the maximum charge that can be held on the isolated sphere 2m diameter, the sphere being in air with dielectric strength 40 kV/cm. What would be the maximum charge if this sphere were in oil of  $\epsilon_r = 3.5$  and dielectric strength of 75 kV/cm.
4. a) Derive an expression for magnetic field intensity at the center of a square current loop.
- b) Prove the following expression for the magnetic field due to infinitely long current element  $\vec{H} = \frac{I}{2\pi\rho} \vec{a}_\phi$
5. a) Justify the equation  $\vec{T} = \vec{m} \times \vec{B}$  for a circular coil carrying a steady current  $I$  is placed such that its plane lies in the xy plane and also parallel to the direction of a uniform magnetic field  $\vec{B}$ .
- b) Obtain the expression for force on a straight and a long current carrying conductor in a magnetic field

6.
  - a) Derive the expression for inductance of a solenoid?
  - b) Obtain the equation for mutual inductance between a straight long wire in the same plane
  
7.
  - a) State and explain the Faraday's laws of electromagnetic induction
  - b) State and explain Poyting theorem



**II B. Tech I Semester Supplementary Examinations, May - 2018**  
**FLUID MECHANICS & HYDRAULIC MACHINES**  
 (Com to ME & Mining Engineering)

Time: 3 hours

Max. Marks: 70

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PART -A

1. a) What is the difference between Dynamic viscosity and kinematic viscosity? (3M)
State their units of measurements.
- b) Discuss minor losses in pipes. (3M)
- c) What do you by a dimensionless number. (2M)
- d) What is the velocity diagram for a turbine blade? What is its use? (2M)
- e) Define NPSH for a centrifugal pump. (2M)
- f) Explain the use of draft tube of a turbine. (2M)

PART -B

2. a) What is metacentric height? Derive the expression for it. (7M)
- b) A uniform body of size 3 m long, 2 m wide and 1 m deep floats in water. What is the weight of the body if depth immersion is 0.8 m? Determine the meta centric height also. (7M)
3. a) Define the equation of continuity. Obtain an expression for continuity equation for a one dimensional flow. (7M)
- b) A 25 cm diameter pipe carries oil of specific gravity 0.9 at a velocity of 3 m/s. At another section the diameter is 20 cm. Find the velocity at this section and mass rate of flow of oil. (7M)
4. a) What do you mean by boundary layer separation? What is the effect of pressure gradient on boundary layer separation? (7M)
- b) A thin plate is moving in still atmospheric air at a velocity of 5 m/s. The length of the plate is 0.6 m and width 0.5 m. Calculate the thickness of the boundary layer at the end of the plate, and drag force on one side of the plate. Take density of air as 1.24 kg/m^3 and kinematic viscosity 0.15 stokes. (7M)
5. a) Derive the expression for work done and efficiency of jet striking centrally on a moving curved vane. Also find the condition for maximum efficiency. (7M)
- b) A jet of water of diameter 150 mm strikes a flat plate normally with a velocity of 12 m/s. The plate is moving with a velocity of 6 m/s in the direction of the jet and away from the jet. Find: (i) the force exerted by the jet on the plate, (ii) Work done by the jet on the plate per second. (7M)

6. a) What is a manometric head of a centrifugal pump? How do you define the specific speed of a centrifugal pump? (7M)
- b) A Centrifugal pump delivers water against a net head of 17.5 meters and a design speed of 1000 r.p.m. The vanes are curved back to an angle of 30° with the periphery. The impeller diameter is 300 mm and out let width is 60 mm. Determine the discharge of the pump if manometric efficiency is 95%. (7M)
7. a) What type of turbine is Kaplan turbine? Explain how it works with a neat diagram. Discuss the importance of draft tube in reaction turbines. (7M)
- b) A pelton wheel is having a mean bucket diameter of 1 m and is running at 1000 r.p.m. The net head on the pelton wheel is 700 m. If the side clearance angle is 20° and discharge through nozzle is $0.15 \text{ m}^3/\text{s}$, find: (i) Power available at the nozzle, and (ii) Hydraulic efficiency of the turbine. (7M)

II B. Tech I Semester Supplementary Examinations, May - 2018

SIGNALS & SYSTEMS

(Com to ECE, EIE and ECC)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

2. Answer **ALL** the question in **Part-A**

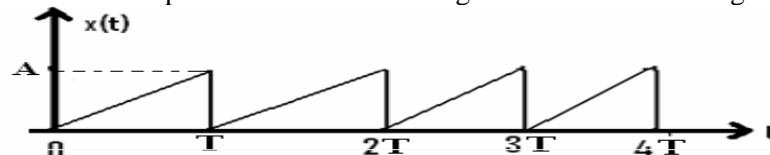
3. Answer any **FOUR** Questions from **Part-B**

PART -A

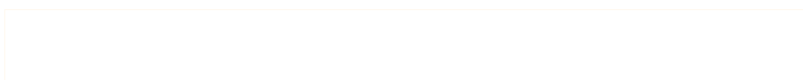
1. a) Define Signal and System. What are the major classifications of the signal? (2M)
- b) Write sampling property of impulse function (3M)
- c) State differentiation and integration properties of Fourier Transform both in time and frequency domains. (2M)
- d) List and state the properties of Autocorrelation function (2M)
- e) State Initial and Final value Theorem of Laplace Transforms (3M)
- f) Define one sided Z- transform and two sided Z-transform? (2M)

PART -B

2. a) Define the error function $f_c(t)$ while approximating signals and hence derive the expression for condition for orthogonality between two waveforms $f_1(t)$ & $f_2(t)$ (7M)
- b) Check whether the following systems are linear or not and stable or not (7M)
 - i) $y(t) = x(t + 2)$
 - ii) $y(n) = n^2x(2n)$
3. a) State the condition for the existence of Fourier transform (7M)
- b) Using the properties of Fourier transform, find the Fourier transform of the following i) $u(-t)$ ii) $e^{j2t}u(t)$ (7M)
4. a) State and Explain the sampling theorem for band pass signals (7M)
- b) Determine the Nyquist sampling rate and Nyquist sampling interval for the following i) $\text{sinc}^2(300\Pi t)$ ii) $\text{sinc}(100\Pi t) + 5\text{sinc}^2(200\Pi t)$ (7M)
5. a) State and explain Parseval's theorem. (7M)
- b) Define auto-correlation and cross-correlation. Prove any two properties of correlation function. (7M)
6. a) State the properties of ROC for Laplace Transform. (7M)
- b) Find out the Laplace transform of the signal shown in below figure. (7M)



7. a) Distinguish between one-sided and two sided z-transforms and its region of convergence. (7M)
- b) Find the inverse Z-transform of $X(z) = \frac{z}{3z^2 - 4z + 1}$ (7M)



II B. Tech I Semester Supplementary Examinations, May - 2018**DIGITAL LOGIC DESIGN**

(Com to CSE & IT)

Time: 3 hours

Max. Marks: 70

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1. a) Convert the hexadecimal number E3FA to binary. (2M)
- b) Perform subtraction operation between $(10010.11)_2$, $(01100.10)_2$. (2M)
- c) State the absorption law of the Boolean algebra. (2M)
- d) Implement the function $F = (AB+CD+E)$, using AND –OR logic. (2M)
- e) Give the comparison between Combinational and Sequential logic circuits. (3M)
- f) Explain about state diagram and state table. (3M)

PART -B

2. a) Subtract the following numbers in 9's complement form (7M)
 - (i) 72532-03250
 - (ii) 03250 -72532
- b) Illustrate by an example how 1's complement and 2's complement of a binary number is obtained?. (7M)
3. a) Reduce the following function using K- map. (8M)

$$F(A,B,C,D) = \sum m(5,6,7,8,9,12,13,14)$$
- b) Implement the following Boolean function using AND, OR and inverter gates (6M)

$$\overline{(AB + CD + E)}$$
4. a) Design a combinational circuit that accesses a 3-bit number and generates output number which is equal to the square of the input. (7M)
- b) Design a 16×1 MUX by using two 8×1 MUX (7M)
5. a) Draw the diagram of master-slave JK flip-flop. (7M)
- b) Convert the JK flip-flop into a T flip-flop. (7M)
6. a) List the applications of shift registers (7M)
- b) Design a Mod-5 synchronous counter using JK flip-flop. (7M)
7. a) Write the difference between mealy machine to moore machine (7M)
- b) What is meant by states reduction? Explain the advantage of state reduction in sequential circuits. (7M)

II B. Tech I Semester Supplementary Examinations, May - 2018
SURVEYING
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) What are the errors in surveying
- b) What are the Errors in compass survey
- c) What are the different Temporary adjustments of a leveling instrument?
- d) Explain the principle of Electronic Theodolite.
- e) Explain the uses of Total Stations?
- f) What is the formula for computation the area along irregular boundaries?

PART -B

2. The distance between two points measured with a Gunter's chain was found to be 7500links. The same distance was measured with an Engineers chain and was found to be 4930 feet. If the Gunter's chain was 0.25 Link too short, what was error in engineer's chain?
3. A 30m steel tape was standardized on the flat and was found to be exactly 3mm under no pull at 66 F. It was used in catenar to measure a base of 5 bays the temperature during the measurement was 92 F and the pull exerted during the measurement was 10kg. The area of the cross section of the tape was 0.08 sq.cm and the specific weights of steel is 7.86 g/cc. $A = 0.0000063$ per 1 F and $e = 2.109 \times 10^{-6}$ kg/sq.cm. Find the true length of the line
4. The following notes refer to reciprocal levels taken with one level

Inst. at	Staff Reading on		Remarks
	P	Q	
P	1.820	2.740	Dist PQ = 1010m
Q	0.928	1.606	RL of P = 126.380

Find (a) true RL of Q (b) Combination for curvature and refraction (c) Angular error in collimation adjustment of the inst.

5. a) Explain any one method of carrying out permanent adjustment of Transit Theodolite.
- b) What is Tacheometer? State the situations where it is used
Explain methods of determination of Tacheometric constants.
6. Explain the principle used in total station. Classify different types of total stations based on range
7. Certain field has three straight sides PQ, QR, RS and an irregular side PS. Calculate the area of the field from the following data. PQ = 130m, QR = 200m, PS = 150m, PR = 230m. Offset taken outwards from PS to the irregular boundary at chain ages 0,30,60,90,120 and 150 have values 0,3,2,1.6,6.8,4.0 and 0

II B. Tech I Semester Supplementary Examinations, May - 2018
ELECTRO MAGNETIC FIELDS
 (Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) What is meant by potential gradient (3M)
- b) Derive the expression for Electric field intensity due to an electric Dipole. (4M)
- c) States the Biot-Savart's law? (3M)
- d) Define magnetic dipole and dipole moment (4M)
- e) What is the significance of coefficient of coupling (4M)
- f) Write the Maxwell's equations for free space (4M)

PART -B

2. a) Explain the concept of electric field and write down expression for the electric field due to a point charge. (8M)
- b) Determine the field strength at a point situated 5cm away from two equal charge of $Q_1 = +10^9\text{C}$ and $Q_2 = 10^9\text{C}$, if the distance between them is 8m. (8M)
3. a) Prove that the derivative of the energy stored in an electrostatic field with respect to volume is $\frac{1}{2} D.E$, where D and E are electric flux density and electric field intensity respectively. (8M)
- b) Cylindrical coordinates, $V = 50\text{volts}$ at $\rho = 5\text{mm}$ and $V = 0$ at $\rho = 65\text{mm}$. Find the voltage at $\rho = 120\text{mm}$, if the potential depends only on ρ . (8M)
4. a) Using Biot-Savart's find an expression for the magnetic field intensity in the vicinity of a straight current carrying conductor of finite length? (8M)
- b) A circuit carrying a direct current of 25A forms a regular hexagon inscribed in a circle of radius 5m. Calculate the magnetic flux density at the centre of the hexagon. Assume the medium to be free space. (8M)
5. a) Derive the expression for torque on a current loop placed in a magnetic field (8M)
- b) Determine the force between two linear parallel conductors carrying currents in opposite direction. (8M)
6. a) Derive the expression for inductance of a solenoid? (8M)
- b) Show that the total energy in a magnetic static field is given by (8M)

$$W_m = \frac{1}{2} \int_v \frac{B^2}{\mu} dv$$
7. a) State and explain the Faraday's laws of electromagnetic induction (8M)
- b) Derive the Maxwell's first equation from Ampere's law (8M)

II B. Tech I Semester Supplementary Examinations, May - 2018**MECHANICS OF SOLIDS**
(Com. to ME, AME, AE, MTE)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**
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PART -A

1. a) Write Hooke's law and draw the stress – strain diagram for mild steel? (4M)
- b) Explain about the concept of shear force? (3M)
- c) Mention the assumptions made in theory of simple bending. (4M)
- d) Explain about Macaulay's method? (4M)
- e) Explain about Thin spherical shells? (4M)
- f) Write the formulae for power by circular shafts? (3M)

PART -B

2. a) An aluminium bar 60 mm diameter when subjected to an axial tensile load 100 kN elongates 0.20 mm in a gage length 300 mm and the diameter is decreased by 0.012 mm. Calculate the modulus of elasticity and the Poisson's ratio of the material. (10M)
- b) Obtain a relation for the stress induced in a body if a load P is applied with an impact. (6M)
3. A beam AB 5m long is simply supported at A and B. It is loaded with point loads of 20kN, 30kN and 20kN at distances of 1m, 3m and 4m respectively from the support A, and a uniformly distributed load at the rate of 20kN/m over the length of 2m, from A. Draw the B.M and S.F. diagrams, indicating the principal values? (16M)
4. The cross-section of a joist is a T-section 12.5 ×12.5×1.2cm with 12.5 cm side horizontal. Find the maximum intensity of shear stress and sketch the distribution of stress across the section if it has to resist a shear force of 90kN. (16M)
5. a) A cantilever 3 m long is of rectangular section 120 mm wide 240mm deep. It carries a uniformly distributed load of 2.5 kN per meter length for a length of 1.5 meters from the fixed end and a point load of 1 kN at the free end. Find the deflection at the free end. Take $E = 10 \text{ GN/ m}^2$. (9M)
- b) Determine the maximum deflection δ in a simply supported beam of length L carrying a concentrated load of P at 1/4 of the span from left hand side. (7M)
6. Design a cylinder of 800.0 mm inner diameter to sustain an internal pressure of 5.0 MPa. Assume $E = 30.0 \text{ GPa}$ and a safe stress of 15.0 MPa. (16M)
7. A hollow circular column having the external and internal diameters of 300 mm and 250 mm respectively carries a vertical load of 100kN at the outer edge of the column. Calculate the maximum and minimum intensities of stress across the

Section _____

II B. Tech I Semester Supplementary Examinations, May - 2018
SIGNALS AND SYSTEMS
 (Com. to ECE, EIE, ECC)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

2. Answer **ALL** the question in **Part-A**

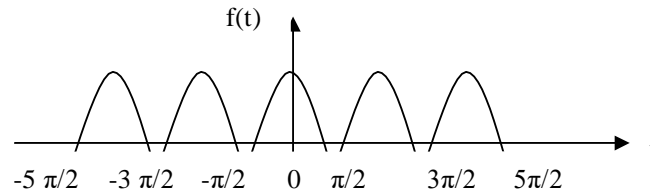
3. Answer any **THREE** Questions from **Part-B**

PART - A

1. a) Find the fundamental period of the Signal $x[n] = \sin\left(\frac{6\pi n}{7}\right) + 1$ (3M)
- b) State the modulation theorem of Fourier Transform. (4M)
- c) What is the impulse response of two LTI systems connected in parallel? (4M)
- d) State convolution properties in relation to Fourier transform. (4M)
- e) Find the Laplace Transform of $e^{-at} u(t)$ (3M)
- f) What is the relationship between Z transform and Fourier transform. (4M)

PART - B

2. a) Evaluate the trigonometric Fourier series expansion of a full wave rectified cosine function as shown. Derive Corresponding Exponential Fourier series. (8M)



- b) Discuss the Orthogonal Signal Space and obtain the expression for mean signal error. (8M)
3. a) and prove Differentiation and integration properties of Fourier Transform. (8M)
 b) Find the Fourier Transform of periodic signals. (8M)
4. a) A stable LTI system is characterized by the differential equation $\frac{d^2 y(t)}{dt^2} + 4 \frac{dy(t)}{dt} + 3y(t) = \frac{dx(t)}{dt} + 2x(t)$ (8M)
 Find the frequency response & Impulse response using Fourier transform.
 b) Differentiate between signal bandwidth and system bandwidth. (8M)
5. a) the detection of periodic signals in the presence of noise by correlation. (8M)
 b) Prove that ACF and PSD forms Fourier Transform Pair. (8M)
6. a) Find the Laplace Transform for the following functions (8M)
 i) $\frac{\sin wt}{t}$ ii) $\frac{1}{s+b}$
 List the properties of ROC for laplace transform
 b) Briefly explain the Constraints on ROC for various classes of signals. (8M)
7. a) Find the inverse z-transform of $x(z) = \frac{1+3z^{-1}}{1+3z^{-1}+2z^{-2}}$ using residue method (8M)
 b) Give the relationship between z-transform and Fourier transform. (8M)

II B. Tech I Semester Supplementary Examinations, May - 2018
DIGITAL LOGIC DESIGN
 (Com. to CSE, IT)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) Convert $(0.513)_{10}$ to octal. (3M)
- b) Implement the Boolean function $F = xy + x'y' + y'z$ with AND and inverter gates (3M)
- c) Design a BCD-to-decimal decoder using the unused combinations of the BCD code as don't care conditions. (4M)
- d) Show that the characteristic equation for the complement output of a JK flip-flop is $Q'(t+1) = J'Q' + KQ$ (4M)
- e) What is the difference between serial and parallel transfer? Explain how to convert serial data to parallel and parallel data to serial. What type of register is needed? (4M)
- f) Write short notes on PLA. (4M)

PART -B

2. a) Add and multiply the following numbers without converting them to decimal. (8M)
 - (i) Binary numbers 1011 and 101.
 - (ii) Hexadecimal numbers 2E and 34.
- b) Explain the concept of radix complement with examples (8M)
3. a) Simplify the following Boolean functions, using four-variable maps: (8M)
 - (i) $F(w, x, y, z) = \sum(1, 4, 5, 6, 12, 14, 15)$
 - (ii) $F(A, B, C, D) = \sum(2, 3, 6, 7, 12, 13, 14)$
 - (iii) $F(w, x, y, z) = \sum(1, 3, 4, 5, 6, 7, 9, 11, 13, 15)$
- b) Simplify the following Boolean functions T_1 and T_2 to a minimum number of literals: (8M)

A	B	C	T_1	T_2
0	0	0	1	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	0	1
1	0	1	0	1
1	1	0	0	1
1	1	1	0	1

4. a) Design a code converter that converts a decimal digit from 8, 4, -2, -1 code to Gray code. (10M)
b) Design an excess-3-to-binary decoder using the unused combinations of the code as Don't-care conditions. (6M)
5. a) Construct a JK flip-flop using a D flip-flop, a two-to-one-line multiplexer, and an inverter. (6M)
b) Explain the differences among a truth table, a state table, a characteristic table, and an excitation table. Also, explain the difference among a Boolean equation, a state equation, a characteristic equation, and a flip-flop input equation. (10M)
6. a) Derive the state tables for the 4 bit ring counter (8M)
b) Explain the working of 3-bit bi-directional shift register with the help of diagram? (8M)
7. a) Tabulate the PLA programming table for the four Boolean functions listed below. Minimize the numbers of product terms. (8M)
 $A(x, y, z) = \sum(1, 3, 5, 6)$
 $B(x, y, z) = \sum(0, 1, 6, 7)$
 $C(x, y, z) = \sum(3, 5)$
 $D(x, y, z) = \sum(1, 2, 4, 5, 7)$
b) Derive the PLA programming table for the combinational circuit that squares a three-bit number. Minimize the number of product terms. (8M)

II B. Tech I Semester Supplementary Examinations, May - 2018
SURVEYING
(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) Explain clearly the points of difference between the Prismatic compass and Surveyor's compass.  
b) What are the sources of errors in Compass Surveying and what precautions are to be taken to eliminate them
2. Explain different methods of plotting a compass traverse?
3. a) Explain the characteristics of contours  
b) Explain the uses of contours maps
4. The following perpendicular offsets were taken at 10 metres intervals from a survey line to a an irregular boundary line. 3.25,5.60,4.20,6.65,8.75,6.20,3.25,4.20,5.65. calculate the area using Average ordinate rule, Trapezoidal rule and Simpson's rule
5. How do you calculate the horizontal and vertical distances between a instrument station and a staff station when the line of collimation is inclined to the horizontal and the staff is held vertically
6. Explain the difference between tangential and stadia tacheometry. How will you determine the stadia constants?
7. Explain about the setting of simple curve with the help of chain and tape and draw neat sketch
8. a) What is Geodetic Surveying? How it is different from Plane surveying?  
b) Discuss in detail the advantages and disadvantages of the Total Station surveying over traditional methods of surveying



**II B. Tech I Semester Supplementary Examinations, May - 2018**  
**ELECTRICAL MACHINES - I**  
 (Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions  
 All Questions carry **Equal** Marks  
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- Derive an expression for the magnetic force developed in a multiply – excited translational magnetic system.
- Name the major parts of a dc machine. Draw the sketch and show the path of magnetic flux in a 4- pole machine.
 - A 4-pole dc generator has a useful flux per pole of 0.07 Wb. The armature has 400 lap-connected conductors, each of resistance 0.002Ω and is rotating at a speed of 900 rpm. If the armature current is 50 A, calculate the terminal voltage.
- How are demagnetising and cross- magnetising ampere – turns/ pole in a D.C. machine calculated.
 - A D.C generator having a commutator of diameter 60 cm rotates at 600 r.p.m. If the width of the brush is 1.2 cm find the approximate time of commutation.
- Explain the process of voltage build up in a dc shunt generator. What is the field circuit critical resistance?
 - A shunt generator has following magnetizing curve :

I_f (amps)	0	0.5	1.0	1.5	2.0
E (volts)	4	42	78	93	100

 Calculate the value of critical resistance.
- Two compound generators G_1 and G_2 (fitted with an equalizing bar) operating in parallel, supply a load of 475 A. The data of these generators are as follows:

	G_1	G_2
Generated e.m.fs., V	250	254
Series field resistance, ohm	0.004	0.006
Armature resistance, ohm	0.02	0.04

 Determine: i) Current in each armature ii) Current in each series winding iii) The current flowing in the equalizing bar (iv) the bus bar voltage. Neglect the shunt field currents
- Describe the significance of back e.m.f that is produced in DC motor.
 - A 10 kW, 240V dc shunt motor draws a line current of 5.2A while running at no-load speed of 1200 rpm from a 240V dc supply. It has an armature resistance of 0.25Ω and a field resistance of 160Ω . Estimate the efficiency of the motor when it delivers rated load.
- Identify the factors that predominantly affect the speed of a dc motor.
 - A. 250 V shunt motor with armature resistance of 0.5Ω runs at 600 rpm on full load and takes an armature current of 20 A. If resistance of 1.0Ω is placed in the armature circuit, find the speed at (i) full- load torque and (ii) half – full load torque.
- Describe how a Swinburne's test is conducted on D.C. machines. State its advantages and disadvantages.

II B. Tech I Semester Supplementary Examinations, May - 2018
THERMODYNAMICS

(Com. to ME, AE, AME, MM)

Time: 3 hours

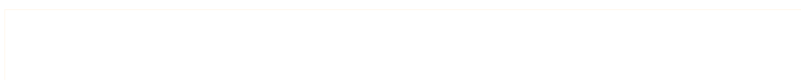
Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) the first artificial earth satellite is reported to have encircled the earth at a speed of 28,840 km/h and its maximum height above the earth surface was started to be 916 km. Taking the mean diameter of the earth to be 12,680 km, and assuming the orbit to be circular, evaluate the value of the gravitational acceleration at this height. The mass of the satellite is reported to have been 86 kg at sea level. Estimate the gravitational force acting on the satellite at the operational altitude?  
b) what is quasi-static process? What is its characteristic feature? (10M+5M)
2. a) A new scale of N of temperature is divided in such a way that the freezing point of ice is  $100^0$  N and the boiling point is  $400^0$  N. What is the temperature reading on the new scale when the temperature is  $150^0$ C? At what temperature both the Celsius and the new temperature scale reading would be the same?  
b) What is constant gas thermometer? Why it is preferred to a constant pressure gas thermometer? (10M+5M)
3. a) A  $200 \text{ m}^3$  rigid tank initially contains atmospheric air at 100 kPa and 300 K and is to be used as storage vessel for compressed air at 1 MPa and 300 K. Compressed air is to be supplied by a compressor that takes in atmospheric air at  $P_o = 100 \text{ kPa}$  and  $T_o = 300 \text{ K}$ . determine the minimum work required for this process.  
b) The interior lighting of refrigerators is provided by incandescent lamps whose switches are actuated by the opening of the refrigerator door. Consider a refrigerator whose 40 W light bulb remains on continuously as a result of a malfunction of the switch. If the refrigerator has a co efficient performance of 1.3 and the cost of electricity is Rs. 8 per kWh, determine the increase in the energy consumption of the refrigerator and its cost per year if the switch is not fixed. (8M+7M)
4. Consider a steam power plant that operates on a reheat rankine cycle has a net power output of 80MW. Steam enters the high pressure turbine at 10MPa and  $500^0$ C and the low pressure turbine at 1 MPa and  $500^0$ C. Steam leaves the condenser as a saturated liquid at a pressure of 10kPa. The isentropic efficiency of the turbine is 80 percent, and that of the pump is 95 percent. Show the cycle on a T-s diagram with respect to saturation lines, and determine i) The quality (or temperature, if superheated) of the steam at the turbine exit, ii) The thermal efficiency of the cycle, and iii) The mass flow rate of the steam. (16M)

5. a) Using the ideal gas equation of state, verify  
i) the cyclic relation ii) the reciprocity relation at constant P.  
b) Show that the internal energy of an ideal gas and an incompressible substance is a function of temperature only,  $u = u(T)$ . (10M+5M)
6. a) What is sensible heat? How is the sensible heat loss from a human body affected by the  
i) Skin temperature  
ii) Environment temperature, and  
iii) Air motion.  
b) Saturated air leaving the cooling section of an air conditioning system at  $14^{\circ}\text{C}$  at a rate of  $50\text{ m}^3/\text{min}$  is mixed adiabatically with the outside air at  $32^{\circ}\text{C}$  and 60 percent relative humidity, at a rate of  $20\text{ m}^3/\text{min}$ . assuming that the mixing processes occurs at a pressure of 1 atm, determine the specific humidity, the relative humidity, the dry bulb temperature, and the volume flow rate of the mixture. (8M+7M)
7. Two engines are to operate on Otto and diesel cycles with the following data. Maximum temperature  $1400\text{ K}$ , exhaust temperature  $700\text{ K}$ . State of air at the beginning of compression  $0.1\text{ Mpa}$ ,  $300\text{ K}$ . Estimate the compression ratios, the maximum pressures, efficiencies, and rate of work outputs(for  $1\text{ kg}/\text{min}$  of air) of the respective cycles? (16M)
8. a) An open cycle (Brayton) aircraft cabin cooler expands air a  $27^{\circ}\text{C}$  through a turbine which is 30% efficient from 2 to 1atm. The cabin temperature is not to exceed  $24^{\circ}\text{C}$ . Estimate the mass flow rate of air required (kg/s) for each tone of cooling.  
b) Determine the ideal COP of an absorption refrigerating system in which the heating, cooling and refrigeration takes place at  $197^{\circ}\text{C}$ ,  $17^{\circ}\text{C}$  and  $-3^{\circ}\text{C}$  respectively. (8M+7M)



## II B. Tech I Semester Supplementary Examinations, May - 2018

## SIGNALS AND SYSTEMS

(Com. to ECE, EIE, ECC, BME)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** QuestionsAll Questions carry **Equal** Marks

- ~~~~~
1. a) Discuss orthogonal vector space and orthogonal signal space and its importance in signal Analysis? (8M)  
b) Explain the analogy between vectors and signals? (7M)
  2. a) State and prove any four properties of Fourier series (8M)  
b) Find the trigonometric Fourier series of  $x(t)=t^2$  over the interval(-1,1) (7M)
  3. a) Briefly explain the following terms i) Hilbert transforms ii) Modulation theorem (8M)  
b) Find the Fourier Transform of the following (7M)  
i) Impulse function  $\delta(t)$  ii) Unit step function
  4. a) Find the impulse response  $h(t)$  of an LTI system with the input and output related by the Equation  $y(t) = \int_{-\infty}^{\infty} e^{-(t-\epsilon)}x(\epsilon - 2)$  (8M)  
b) Explain filter characteristics of linear systems. What are the conditions to obtain distortion less transmission through the linear systems? (7M)
  5. a) Prove that the auto-correlation function and energy density spectrum form a Fourier Transform pair (8M)  
b) Find autocorrelation of the signal  $x(t)=A\cos(\omega_0 t + \theta)$  (7M)
  6. a) Explain sampling theorem for Band limited signals with a graphical example (8M)  
b) Define Nyquist rate. Compare the merits and demerits of performing sampling using impulse, natural and flat-top sampling techniques. (7M)
  7. a) Determine the inverse Laplace transform of the following (8M)  
i)  $\frac{2}{s(s+1)(s+2)}$  ii)  $\frac{1}{(s+1)(s+5)}$   
b) Determine the Laplace transform of the following (7M)  
i)  $x(t) = 2te^{-2t}$  ii)  $x(t) = t\cos(at)$
  8. a) State and prove initial and final value theorems of Z-transforms (8M)  
b) Using final value theorem find  $x(\infty)$ , if  $X(z)$  is given by (7M)  
i)  $\frac{z+1}{(z-0.6)^2}$  ii)  $\frac{2z+3}{(z+1)(z+3)(z-1)}$

**II B. Tech I Semester Supplementary Examinations, May - 2018****DIGITAL LOGIC DESIGN**

(Com. to CSE, IT)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

1. a) Perform the following using 6's complement:
  - i.  $(26)_7 - (42)_7$
  - ii.  $(126)_7 - (42)_7$
 b) Explain in detail about non-weighted codes
2. a) Minimize below expression using EX-NOR function
 
$$f = ABC + A\bar{B}C + ACD + AC\bar{D}$$
 b) Simplify the following function and implement it with NAND gates  
 $F_1 = (B^1 + D^1)(A^1 + C^1 + D)(A + B^1 + C^1 + D)(A^1 + B + C^1 + D^1)$
3. a) Minimization of function f using K-map  
 $f(A,B,C,D) = \sum(0,2,3,4,6,7,8,10,11,15)$ 
 b) What is standard POS form? Write the procedure Conversion of POS form to standard POS form with example
4. a) Design Full adders from half adder and write the applications of full adder
 b) Draw and explain about look-a-head adder circuit
5. a) Design full adder from 3 to 8 decoder
 b) Define Multiplexer and explain the procedure to implement 32 X 1 MUX by Using 4 X 1 Multiplexers
6. a) Implement  $f(A,B,C,D) = \sum(0,1,3,5,6,8,9,11,12,13)$  using PROM and explain its procedure
 b) Design and implement Full adder with PLA
7. a) Write the differences between Latch and Flip-Flop
 b) Explain about Master-slave J-K flip-flop
8. a) What is a shift register? Draw the block diagram and timing diagram of a shift register that shows the serial transfer of information from register A to register B.
 b) Explain about decade ripple counter

**II B. Tech I Semester Regular/Supplementary Examinations, October/November - 2018**  
**SURVEYING**  
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. Answer **ALL** the question in **Part-A**  
3. Answer any **FOUR** Questions from **Part-B**
- ~~~~~

**PART -A**

1. a) Write the Uses of surveying
- b) What is Electronic distance measurements
- c) Write the Characteristics of contours.
- d) Explain the Principles of Electronic Theodolite
- e) Write the difference between simple and compound curves
- f) How to calculate capacity of reservoir

**PART -B**

2. a) What are different methods of plane Surveying? Under what circumstances they are preferred? Also give salient features of these methods
- b) What do you understand by closing error? Show how can it be adjusted by graphical method
3. What is local attraction? Explain how the bearings are corrected for local attraction
4. a) What is meant by the reduction of levels? Explain briefly the different methods of leveling
- b) Explain in detail how the contour plan is used to calculate the capacity of a reservoir
5. a) Describe the various types of Theodolite
- b) How would you measure a horizontal angle by reiteration method?
6. What is meant by degree of a curve? What are the different methods of designating a curve? Derive a relationship between the degree of a curve and its radius.
7. a) A straight level road is to be constructed along hill side having lateral slope of 1 in 8. The formation width is 25 m with side slopes 1: 1 in cutting and 2: 1 in filling. Calculate the total volume of earth work in a length of 257 m if the area of cutting and fill in each cross section are equal.





Code No: R1621015

**R16**

**SET - 2**

**B.Tech I Semester Regular/Supplementary Examinations, October/November - 2018**

**SURVEYING**  
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

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**II B. Tech I Semester Regular/Supplementary Examinations, October/November - 2018**  
**SURVEYING**  
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

- 
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **FOUR** Questions from **Part-B**
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**PART -A**

1. a) Write the Errors in survey measurements
- b) Define Meridians, Azimuths and Bearings,
- c) Write the Uses of contours
- d) Write the uses and adjustments of Theodolite
- e) Write about geodetic surveying
- f) Write the formula to calculate areas

**PART -B**

2. a) Explain the principle on which chain survey is based.
- b) What factors should be considered in deciding the stations of a chain survey?
3. a) What is declination? What are different types of variations in declination?
- b) In an old survey made when the declination was 40 W, the magnetic bearing of a given line was 2100. The declination in the same locality is now 100 E. What are the true and present magnetic bearing of the line?
4. a) The following consecutive readings were taken with a level and 3 m leveling staff as a continuously sloping ground at a common interval of 20m, 0.602, 1-234, 1.860, 2.574, 0.238, 0.914, 1.936, 2.872, 0.568, 1.824, 2.722. R. L of the first point was 192.122. Calculate reduced levels of points and gradient of the line joining first and the last points
- b) Compare Rise and Fall method of leveling with Height of collimation method.
5. Give a list of the permanent adjustments of a transit theodolite and state the object of each of the adjustment. Describe how you would make the Trunnion axis perpendicular to the vertical axis.
6. Given that the intersection angle of a two degree curve is  $120^0$ , Compute the various elements of a simple curve.
7. a) Discuss different methods of computation of area from field notes.
- b) A straight railway embankment is made on a ground having a transverse slope of 1 in 8. The formation width of the embankment is 30m. and the side slopes are 1.5H to 1 V. At three sections 50m apart, the heights of the bank, at the center of the formation level are 10m, 15m and 18m. Compute volume of earthwork involved in

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**R16**

SET - 4

**II B. Tech I Semester Regular/Supplementary Examinations, October/November - 2018**  
**SURVEYING**  
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

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the embankment

**II B. Tech I Semester Regular/Supplementary Examinations, October/November - 2018**  
**SURVEYING**  
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. Answer **ALL** the question in **Part-A**  
3. Answer any **FOUR** Questions from **Part-B**
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**PART -A**

1. a) Write the Principles of surveying
- b) Define Azimuths and Bearings
- c) Explain the different methods of conducting contour surveys
- d) Discuss briefly on Tachometric Surveying
- e) Write the importance of Total Station
- f) Write the formula to calculate volumes

**PART -B**

2. What do you mean by orientation? Explain different methods of orienting the plane Table with the help of neat sketches.
3. What are the essential differences between chain Survey and compass Survey. Under what circumstances compass Survey is preferred to other types of Surveys
4. a) Explain briefly fly levelling and reciprocal leveling
- b) The following readings were taken with a level in sequence as follows: 1.585, 1.315, 2.305, 1.225, 1.325, 1.065, 1.815 and 2.325 The level was shifted after the third and sixth readings. The second change point was a bench mark of elevation 150.375m. Find the reduced levels of the remaining stations. Use the rise and fall method.
5. a) Describe how you would test and if necessary adjust the line of collimation of a vernier Theodolite.
- b) When would you suggest a Theodolite traversing by the method of deflection angles. Explain with neat sketch
6. What are the different methods of setting out simple curves? Explain Rankines method of deflection angles for setting out curves
7. a) What is a prismoid? Derive the prismoidal formula
- b) What is Simpson's rule? Derive an expression for it

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2. Answer **ALL** the question in **Part-A**  
3. Answer any **FOUR** Questions from **Part-B**
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**PART -A**

1. a) What are the Objectives of surveying
- b) Define Bearings
- c) Write the permanent adjustments in levelling
- d) Write the principles of Theodolite
- e) Discuss on Global positioning system
- f) How to calculate volume of borrow pits

**PART -B**

2. a) List out the different accessories of plane table Surveying. Also explain the purpose for which they are used
- b) What are the various accessories required in linear measurements? Describe briefly.
3. a) Explain the different methods of plotting a compass traverse
- b) Explain clearly the difference between prismatic compass and surveyors compass?
4. a) Explain the steps involved in levelling.
- b) What is “differential levellings”? How it differs from “Reciprocal levelings”?
5. Obtain an expression for the difference of level between two points A and B, a considerable distance apart, B being the higher, by vertical angle readings from the point A. Take into account the height of the instrument at A and the height of the target at B. What is the assumption made in obtaining your equation for the difference of level?
6. Calculate the ordinates from the long chord at 7.5 m interval to set out a simple circular curve of 100. The length of the long chord is 100m.
7. a) What is Trapezoidal Rule. Derive an expression for it.
- b) In order to obtain area of a plot, a series of perpendicular offsets 2.2m, 3.0m, 1.65m, 2.46m, 2.0m, 2.25m and 1.68m were laid from a survey line to an irregular boundary at regular intervals of 5m. Find the desired area using

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**R16**

SET - 7

**II B. Tech I Semester Regular/Supplementary Examinations, October/November - 2018**

**SURVEYING**  
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

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i. Trapezoidal rule ii. Simpson's Rule

