



Department of Electronics and Communication Engineering  
University College of Engineering  
Osmania University  
Hyderabad-500007, Telangana, India.

GRNSS and Augmentation System  
(PE V)

Date: 10-04-2023

Time: 12:00 Noon to 1:00 PM

Internal Examination-I  
B.E. (ECE) VIII-Sem

Max. Marks: 20M

	PART-A (Answer all Questions)	Marks	BT	CO
1.	List out the limitations of Transit.	1	1	1
2.	Differentiate between UTC time and IST time.	1	2	1
3.	Memorize which GPS coordinate system is most commonly used and why?	1	1	2
4.	1 mean sidereal day = _____ sec.	1	2	2
5.	Find the Ionospheric delay observed on L1 (1575.42 MHz) frequency, if TEC observed on GPS satellite is 50 TECU.	1	3	3
6.	Comment on the user position if (a) DOP=5, (b) DOP=2.	1	2	2
	PART-B (Answer any Two of the following)			
7. (a)	Explain the principle of Trilateration and discuss about various GPS operating frequencies.	3	2	1
(b)	i) Explain the functions of GPS control segment. ii) Find the position accuracy if GDOP observed is 3.5 and UERE is 10 m.	4	3	1
8.(a)	Classify the GPS receivers according to the frequency and type of application. Explain these in detail.	4	2	2
(b)	Discuss, what do you understand by C/A and P-code. Explain in detail about GPS signal structure.	3	3	2
9(a)	Describe the GPS major errors and explain their sources and mitigation.	4	2	3
(b)	Appraise the need of RINEX data format and explain about Observation and Navigation file formats	3	5	3



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GRNSS and Augmentation System  
Class Test-II  
B.E. (ECE) VIII-Sem

Max. Marks: 20M

Time: 12:00 Noon to 1:00 PM

**PART-A (Answer all Questions)**

**PART-A (Answer all Questions)**

		Ma rks	BT	CO
1.	Identify the need of RINEX data format and give the abbreviation of word 'RINEX'?	1	1	3
2.	Memorize which signal is known as 'GPS modernized redundant signal' and why?	1	1	4
3.	Classify any two applications of GPS in Recreation and Sports.	1	2	3
4.	Differentiate between space segment of Japanese QZSS with that of US GPS is?	1	4	5
5.	List out any two advantages of MSAS over GAGAN.	1	1	5
6.	Classify the characteristics of Safety of Life GPS signal?	1	2	4
<b>PART-B (Answer any Two of the following)</b>				
→ 7(a)	Discuss in detail about RINEX Navigation and Observation data formats.	4	6	3
(b).	Explain briefly about the Objectives and need of GPS modernization plans.	3	5	4
8(a)	Argue how GPS can be integrated with various applications and explain in detail about any two of them.	4	5	4
(b)	With a neat architectural diagram, explain the operating principle of LAAS.	3	2	5
9(a)	With a neat architectural diagram, explain the operation of Indian NavIC.	4	2	5
(b)	Appraise new modernized control segment of GPS and explain about it in detail.	3	6	3



**OSMANIA UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**UNIVERSITY COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**B.E. (ECE) VIII-Semester (Main) Examinations May 2023**

**GRNSS AND AUGMENTATION SYSTEMS**

(Professional Elective –VI)

Time : 3 hours

Max. Marks : 70

- Note :** i) Answer *Question No. 1 (Compulsory)* and Answer any *four questions* from the remaining questions (2- 7).  
 ii) Answers must be written in same order as they occur in the Question Paper.  
 iii) Missing data, if any, may suitably be assumed.

	Marks	BT	CO
1. a) Define GPS satellite transit.	2	1	1
b) List the GPS segments and give the function of control segment.	2	1	1
c) Outline the coordinated universal time.	2	2	2
d) What is a datum.	2	1	2
e) Define and explain the multipath error.	2	1	3
f) What is pseudolite integration with respect to GPS .	2	1	4
g) List the GEO uplink errors.	2	1	5
2. a) Explain the method used in geometry to determine the position of an object in space by measuring its distance.	7	2	1
b) Illustrate the three Keplerian orbital elements defining the orientation of the orbit.	7	2	1
3. a) With neat sketch and relevant equations, explain the GPS L1 signal generation.	7	3	2
b) Demonstrate the Earth-Centered Earth-Fixed Coordinate System.	7	2	2
⇒ A. a) Discuss about Ionospheric errors and Tropospheric errors.	7	6	3
b) Explain about (i) Sources of GPS error (ii) Propagation errors.	7	2	3

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|---------|--|---|---|---|
| → 5. a) | Demonstrate about the differential GPS and give its merits and demerits.       | 7 | 2 | 4 |
| b)      | Illustrate about the GPS Integration with Geographic Information System (GIS). | 7 | 2 | 4 |
| 6. a)   | Explain the SBAS error sources and integrity threats.                          | 7 | 2 | 5 |
| b)      | Discuss the Japanese QZSS program.   | 7 | 6 | 5 |
| → 7. a) | Explain in detail about the Spoofing and Anti-spoofing.                        | 7 | 2 | 2 |
| b)      | Demonstrate the Local Area Augmentation System.                                | 7 | 2 | 5 |

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UCE(A), OU - 1005



# UNIVERSITY COLLEGE OF ENGINEERING (A)

Osmania University, Hyderabad-07

## CLASS TEST – I

### APPLICATIONS OF ELECTRICAL ENERGY

(Open Elective – III)

Class: B.E. (Civil, Mech, ECE, BME, CSE)

Semester: VIII

Academic Year: 2022 – 2023

Max Marks: 20

Duration: 1 hr

Date: 10/04/2023

**Note :** (i) Answer all questions in PART-A and any two questions from PART-B.

PART A		Marks	BT	CO
Answer All Questions (6 M)				
1. a)	1 Angstrom Unit = <u><math>10^{-8}</math></u> cm	1	1	3
b)	Unit of Illumination (a) REXONA (b) HAMAM (c) PEARLS (d) LUX	1	2	3
c)	What is meant by glare	1	2	3
d)	Define scheduled speed	1	3	3
e)	An electric train moving at a maximum speed of 80 km/h, its acceleration is 2 km/h/s, what is the time duration of acceleration.	1	4	3
f)	An electric train power supply from over head catenary wire moving from north to south direction at speed of 70 km/h, in what direction the smoke will flow.	1	2	3
PART B				
Answer Any Two Questions (14 M)				
2. a)	A hall of $30 \times 20$ m area with a ceiling height of 6 m is to be provided with a general illumination of 200 lumens/m <sup>2</sup> , taking a coefficient of utilization of 0.6 and depreciation factor of 1.6. Determine the number of fluorescent tubes required, their spacing, mounting height, and total wattage. Take luminous efficiency of fluorescent tube as 25 lumens/W for 300-W tube.	5	2	3
b)	Draw vertical and horizontal polar curve.	2	3	3
3.	A 350-tonne electric train runs up an ascending gradient of 1% with the following speed/time curves : 1. uniform acceleration of 1.6 km/h/s for 25 seconds 2. constant speed for 50 seconds 3. coasting for 30 seconds 4. braking at 2.56 km/h/s to rest. Compute the specific energy consumption if train resistance is 50 N/t, effect of rotational inertia 10%, overall efficiency of transmission gear and motor, 75%.	7	2	3

4. a) A train runs between two stations 1.6 km apart at an average speed of 36 km/h. If the maximum speed is to be limited to 72 km/h, acceleration to 2.7 km/h/s, coasting retardation to 0.18 km/h/s and braking retardation to 3.2 km/h/s, compute the duration of acceleration, coasting and braking periods. 4 2 3
- b) The luminous intensity of a source is 600 candela is placed in the middle of a  $10 \times 6 \times 2$  m room. Calculate the illumination: 3 5 3
1. At each corner of the room.
  2. At the middle of the 6 m wall.





**UNIVERSITY COLLEGE OF ENGINEERING (A)**

**Osmania University, Hyderabad-07**

**CLASS TEST – II**

**APPLICATIONS OF ELECTRICAL ENERGY**

(Open Elective – III)

**Class: B.E. (Civil, MECH, ECE & BME)**

**Semester: VIII**

**Academic Year: 2022 – 2023**

**Max Marks: 20**

**Duration: 1 hr**

**Date: 10/05/2023**

**Note :** (i) Answer all questions in PART-A and any two questions from PART-B.

**PART A**

Answer All Questions (6 M)

	Marks	BT	CO
1. a) Give the classification of various electric heating methods.	2	1	1
b) Draw the schematic diagram of three brush generator.	2	4	5
c) What do you understand by primary and secondary batteries, mentions its applications.	2	2	2

**PART B**

Answer Any Two Questions (14 M)

2. a) Explain the principle operation of direct resistance heating with help of neat schematic diagram.	4	1	1
b) Determine the efficiency of a high-frequency induction furnace which takes 10 minutes to melt 2 kg of a aluminium initially at a temperature of 20°C. The power drawn by the furnace is 5 kW, specific heat of aluminium = 0.212, melting point of aluminium = 660° C and latent heat of fusion of aluminium. = 77 kcal/kg.	3	2	1
3. a) Explain the principle equipment of single battery system with help of neat schematic diagram.	4	2	5
b) Draw and explain the schematic diagram of Rosenberg dynamo.	3	3	5
4. a) Explain the maintenance and applications of lead acid cells.	4	2	2
b) Explain core type induction furnace with help of neat schematic diagram.	3	3	1

$$2(b) \quad Q = 2 \times 0.212 \times (660 - 20) = 271.4 \text{ kcal}$$

$$\text{Total heat to melt} = 2 \times 77 \text{ kcal} = 154 \text{ kcal}$$

$$\text{Total heat} = 154 + 271.4 = 425.4 \text{ kcal}$$

$$\frac{425.4 \text{ kcal}}{2} \xrightarrow{10 \text{ min}} \xleftarrow{60 \text{ min}} = 2552.4 \text{ kcal/hr}$$

Converting to Watts: Power del =  $\frac{2552.4 \times 4.18}{860} = 2.96 \text{ kW}$

$$\eta = \frac{2.96 \text{ kW}}{5 \text{ kW}} \times 100 = 59.4\%$$

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**B.E. (All Branches) VIII-Semester (Main) Examinations May 2023**  
**APPLICATIONS OF ELECTRICAL ENERGY**  
**(Open Elective-III)**

Time : 3 hours

Max. Marks : 70

- Note : i) Answer Question No. 1 (Compulsory) and answer any four questions from the remaining questions (2- 7).  
 ii) Answers must be written in same order as they occur in the Question Paper.  
 iii) Missing data, if any may suitably be assumed.

	Marks	BT	CO
1. a) What are the various modes of heat transformer.	2	1	1
b) Give the classification of various methods of electric welding.	2	3	2
c) Draw the horizontal and vertical polar curves.	2	2	3
d) Mention the various systems of track electrification.	2	5	4
e) Draw the neat schematic diagram of Rosenberg dynamo.	2	1	5
f) An electric train power supply from over head catenary wire moving from north to south direction at speed of 85 km/h, in what direction the smoke will flow.	2	3	3
g) A room with an area of $6 \times 9$ m is illuminated by ten 80 W lamps. The luminous efficiency of the lamp is 80 lumens/W and the coefficient of utilization is 0.65. Find the average illumination.	2	2	4
2. a) Explain core type induction furnace with help of neat schematic diagram.	7	1	1
b) Determine the efficiency of a high-frequency induction furnace which takes 10 minutes to melt 2 kg of a Aluminum initially at a temperature of $20^{\circ}\text{C}$ . The power drawn by the furnace is 5 kW, specific heat of Aluminum = 0.212, melting point of Aluminum = $660^{\circ}\text{C}$ and latent heat of fusion of Aluminum. = 77 kcal/kg.	7	4	1



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|-------|---|---|---|---|
| 3. a) | Explain various types of electric resistance welding with help of neat schematic diagrams.  | 7 | 6 | 2 |
| b)    | Explain the maintenance and applications of lead acid cells.  | 7 | 5 | 2 |
| 4. a) | Explain Rousseau's diagram construction with help of neat schematic diagram.  | 7 | 2 | 3 |
| b)    | A hall of $30 \times 20$ m area with a ceiling height of 6 m is to be provided with a general illumination of 200 lumens/m <sup>2</sup> , taking a coefficient of utilization of 0.6 and depreciation factor of 1.6. Determine the number of fluorescent tubes required, their spacing, mounting height, and total wattage. Take luminous efficiency of fluorescent tube as 25 lumens/W for 300-W tube. | 7 | 4 | 3 |
| 5. a) | Derive the expression for quadrilateral speed time curve from basis.  | 7 | 3 | 4 |
| b)    | A train runs between two stations 1.6 km apart at an average speed of 36 km/h. If the maximum speed is to be limited to 72 km/h, acceleration to 2.7 km/h/s, coasting retardation to 0.18 km/h/s and braking retardation to 3.2 km/h/s, compute the duration of acceleration, coasting and braking periods.   | 7 | 1 | 4 |
| 6. a) | Explain the single battery system with help of neat schematic diagram.  | 7 | 2 | 5 |
| b)    | Explain the principle operation of three brush generator with help of neat schematic diagram.   | 7 | 5 | 5 |
| 7. a) | Derive the expression for specific energy consumption from basis.   | 7 | 4 | 3 |
| b)    | Explain the laws of illumination.   | 7 | 2 | 4 |

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