KUMARAGURU
college of technology
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Register Number:……..….

M.E DEGREE EXAMINATIONS: NOV/DEC 2016

(Regulation 2015)

Third Semester

COMMUNICATION SYSTEMS

P15COTE20: Global Positioning Sysems

COURSE OUTCOMES

CO1: Explain the basic principles of satellite navigation.

CO2: Analyze and compare various coordinate systems used in GPS.

CO3: Discuss and compare the various pseudo codes used in GPS transmission

CO4: Analyze the ionospheric and tropospheric effects on GPS signals.

CO5: Compare the features of ground GPS, air borne GPS and space borne GPS.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. What is the usual sequence of steps in code correlation and squaring technique in digital signal processing(K2) CO3 [K_2]

   1. Filtering
   2. Autocorrelation
   3. Cross correlation
   4. Output message

   a) 1-2-3-4 b) 2-3-1-4

   c) 2-1-3-4 d) 3-4-1-2

2. GPS space segment has an altitude of CO2 [K_2]

   a) 22,000km b) 20,200km

   c) 42,000km d) 42,300km

3. When continuous tracking of satellite is interrupted by an obstruction ----------occurs CO4 [K_2]

   a) blunder b) Cycle slip

   c) multipath d) noise

4. Match the following satellite categories with its design life in years. CO1 [K_2]

List I	List II
A. Block -IIF	i. 7.5
B. Block -IIA	ii. 15
C. Block -IIR	iii. 4.5
D. Block -I	iv. 10

a) 2 1 4 3 b) 1 2 3 4

c) 3 2 1 4 d) 4 3 2 1

5. Tropospheric delay ranges between CO4 [K_2]

a) 2-25m b) 25-50m

c) 50-100m d) 50-75m

6. **Assertion (A):**Smaller the DOP higher the precision(K2) CO1 [K_2]

Reason (R) : DOP varies with time and location

a) both A and R are individually true and R is the reason for A b) both A and R are individually true and R is not the reason for A

c) A is true but R is false d) A is false but R is true.

7. **Assertion (A):**Effect of Ionosphere in GPS signal varies with time CO4 [K_2]

Reason (R) : Ionization level of Ionosphere depends on intensity of sunlight

a) both A and R are individually true and R is the reason for A b) both A and R are individually true and R is not the reason for A

c) A is true but R is false d) A is false but R is true.

8. Which of the following parameter describes the irregularities of earth rotation CO2 [K_2]

a) Dilution of precision b) Earth orientation parameter

c) Length of the day d) Equinox

9. Which of the following is the incorrect term used to represent the longest day or night? CO2 [K_2]

i)Solstice ii) Equinox iii) Equator iv) ephemeris

a) (ii), (iii), and (iv) b) (i),(ii) and (iii)

c) (i)& (ii) d) (i),(iii) & (iv)

10. A branch of earth science dealing with the physical processes and phenomena occurring especially in the earth and in its vicinity CO5 [K_2]

a) Atmospheric Occulation b) Gravity Field Mapping

c) Crystal Dynamics d) Geophysics

PART B (10 x 2 = 20 Marks)

11.	Mention the significance of GLONASS	CO1	[K_2]
12.	List out the reasons behind irregularity in earth rotation.	CO2	[K_2]
13.	Write a brief note on differential GPS.	CO3	[K_2]
14.	What is dilution of precision and what are its types?	CO1	[K_2]
15.	Define equinox and solstice.	CO2	[K_2]
16.	Mention the significance of OTF Ambiguity	CO3	[K_2]
17.	List out the methods to minimize Multipath Effect.	CO4	[K_2]
18.	Write a brief note on Ephemerides.	CO4	[K_2]
19.	What is Atmospheric Occulation?	CO5	[K_2]
20.	Define Geophysics.	CO5	[K_2]

PART C (6 x 5 = 30 Marks)

21.	Explain the control and user GPS segment in detail	CO1	[K_2]
22.	Discuss in detail the navigation messages and its formats	CO3	[K2]
23.	Write a brief note on time systems in GPS	CO2	[K_2]
24.	Explain Gravity Field Mapping in detail	CO5	[K2]
25.	Discuss in detail about Data Combination: Narrow Lane; Wide Lane	CO3	[K_3]
26.	List the different types and write a brief note on GPS error sources	CO4	[K_3]

Answer any FOUR Questions

PART D (4 x 10 = 40 Marks)

27.	State and explain the significance of anti spoofing, selective availability and DOP factors	CO1	[K_3]

28.	Compare and contrast the features and significance of C/A code and Y-code	CO3	[K_4]
29.	Explain in detail about the signal processing and its processing techniques	CO3	[K3]
30.	Discuss in detail about Elements of Wave Propagation and Ionospheric Effects on GPS Observations	CO4	[K_3]
31.	Elaborate the salient features air borne and space borne GPS	CO5	[K_2]

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