Register Number.....

M.E. DEGREE EXAMINATIONS: OCTOBER/NOVEMBER - 2008

Third Semester

COMMUNICATION SYSTEMS

P07CME09: Global Positioning Systems

Time: 3 Hours **Maximum Marks: 100**

Answer ALL Questions: -

PART A (20 × 1 = 20 Marks)

1. Selective availability is

A. the limited window of time B.to deny full access to unauthorized users.

C. access to the Y-code D.local tangent-plane coordinate system

2. Differential GPS is

A. a method for correcting GPS measurements B. Carrier Phase GPS positioning.

C. GPS code-tracking receiver.

D. The design variations between the US and the Russian satellite positioning systems.

3. High accuracy, survey quality GPS is usually associated with:

A. differential code phase tracking B.low-cost GPS

C.differential carrier phase tracking D.No post-processing software

4. NAVSTAR system is owned by

A. United States B. Russian Federation C.France D.India

5. In the GPS system what is the minimum number of satellites that the receiver needs to be communicating with to determine position (latitude, longitude and height) as well as time?

A.2 B.3 C.4 D.5

6. An error of 0.0001 seconds exists between a satellite and a GPS receiver, which are 30000 km apart. Express this error in km.

A .0.3 km B.3 km C.30 km D.300 km

7. The semi-major axis of Pluto is 39.4 Astronomical Units. Use Keplers third law to obtain its period in earth years.

A. 150 B.250 C. 350 D. 450

8. Atomic Time is a time system

A. kept by atomic clocks B. a uniformly-scaled time

C.measure of the Earth's rotation D.hour angle of the vernal equinox.

9. C/A being transmitted with a frequency of

A.1.5 GHz B. 1.023 MHz C.100 KHz D. 850 MHz

10. Navigation message consists of

A. 50 data frames B. 20 data frames C.25 data frames D.40 data frames

11. The value of L2 frequency

A. 1575.42 MHz B. 1227.60 MHz C. 1381.05 MHz D. 1379.913 MHz

12. Ephemeris is

A. list of accurate positions B.An instantaneous event of measurement

C. level of GPS system capability D. Relative to the Earth as a center

13. The ionospheric effect is an important _____ _____in GPS measuring.

A. error source B. GPS observations C. relativistic effects D.clock errors

14. Troposphere is the _____of atmosphere over the Earth's surface.

A. upper part B. lower part C. ionosphere D. dispersive medium

15. Cycle slip is defined as a _____.

A. Visual inspection B. double difference C. Radio interference D. discontinuity

16. The GPS satellite clock error is

A. 1 millisecond per day B. 5 microseconds per day

C. 8.64 to 17.28 nanoseconds per day D. 650 milliseconds per day

17. Airborne GPS

A. reduces the ground control points B.increases the ground control points

C. Increases the quality of ground station D. Increases the quality of ground station

18. Applications of space-borne GPS to Earth science include_ _____ precise orbit determination.

A. meter level B. centimeter-level C. micro-meter level D. No

19. GPS surveying

A. increases the accuracy B. decreases the accuracy

C. increases the measuring instruments D. decreases the measuring instruments

20. The latitude, longitude, and altitude displayed by a GPS receiver represent:

A.an estimate of the receiver's antenna position B. the height above MSL

C.the three dimensional positions fix with millimeter accuracy

D.the height above the reference ellipsoid

PART-B (5 × 16 = 80 Marks)

21. (a)(i) Discuss the developments of NAVSTAR and GLONASS global positioning systems. (8)

(ii)What is GNSS? Explain its principle of working. (8)

(OR)

(b) Describe the principle of Static and Kinematic positioning. (16)

22. (a) Describe the principle of geo centric co-ordinate system and list its applications. (16)

(OR)

(b) Derive the Keplerian equation. (16)

23. (a) Describe the un-differenced and differenced range models. (16)

(OR)

(b) Explain the signal processing techniques in GPS. (16)

24. (a)How the Satellite antenna phase centre correction and receiver antenna phase centre corrections are achieved in GPS? (16)

(OR)

(b)Describe the effects of ionosphere and troposphere on GPS observations. (16)

25. (a)Discuss the following
1. Crystal dynamics (8)
2. Gravity field mapping (8)

(OR)

(b) Explain the applications of GPS in metrological and climate research. (16)

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