NAUTICAL SCIENCE

GRADE 12

OPEN BOOK TEST

Introduction

1. Number all the pages in the handout 1 to 29.

Gyro compass

2. How many gyro compasses does the average seagoing vessel carry?

3. On what principle does the gyro work?

4. How long before you sail should the gyro be switched on?

5. Name four positions where you will find gyro repeaters and three other pieces of nav equipment which is fed by the gyro.

6. How do you check the accuracy of the gyro compass:

    a. When in sight of land.

    b. When on the open ocean (out of sight of land).

Logs

7. Name the various types of log found aboard seagoing vessels.

8. Very briefly,

    a. how does a Pitometer log work?

    b. how does a chernikeef log work?

    c. how does an electromagnetic log work?

    d. how does a doppler log work?

9. What is the basic difference in the results achieved by the first three and the last?

10. The doppler log has range restriction because of the absorption of the energy by the water. What is the max depth it can operate in?

11. What frequency range does the doppler log operate in?

Echo sounder/depth recorder

12. What does the echo sounder record?

13. Briefly describe how it operates.

14. What frequency range does the echo sounder work?

ARPA

15. What does ARPA stand for?

16. What are the capabilities of ARPA?

17. What sort of information will ARPA display?

18. What other facilities does ARPA provide?

AIS

19. What does AIS stand for?

20 Basically describe how AIS works.

21. In what frequency band does the AIS operate?

22. What is the typical range of AIS?

23. What sort of information does an AIS system transmit?

GPS

24. What does GPS stand for?

25. How many satellites does the GPS comprise?

26. What is the navigational accuracy of the system?

27. What is the basic principle behind the operation of GPS?

28. Describe briefly the composition and operation of the space segment of GPS.

29. Describe briefly the composition and operation of the ground segment of GPS.

ECDIS

30. What does ECDIS stand for?

31. Where does ECDIS get all its inputs from?

32. The system was designed to replace the old paper chart with digital or electronic charts. What are the advantages of the new system over the old paper charts? What does the new system provide?

33. Two types of electronic chart are in use at present. What are they?

34. Describe each of the above two types.

MARINE RADIO BEACONS

36. In what frequency band did the marine radio beacons operate?

38. What was the range of these beacons?

39. The system had two main shortcomings. What were they?

RADAR TRANSPONDER BEACONS

40. In what frequency bands do they operate?

41. What is their typical range?

42. Briefly describe their operation.

DECCA POSITION FIXING

43. The Decca system is made up of a number of chains. What did each chain consist of?

44. Describe briefly how the system worked.

45. In what frequency band did it operate?

46. What was the range of the system:

    a, during the day?

    b. during the night?

AMERICAN TRANSIT SYSTEM

47. The American transit system was the forerunner to the GPS system. Describe it in terms of the following:

    a. Number of satellites,

    b. Height of orbit.

    c. Type of orbit.

    d. Time to complete one full orbit.

    e. Principle upon which it operated.