

中华人民共和国海船船员适任考试同步辅导教材

# 轮机英语

(管理级)

主 编 党 坤

副主编 郑庆功 李文华 李伟



大连海事大学出版社

中华人民共和国海船船员适任考试同步辅导教材

# 轮机英语

## (管理级)

主 编 党 坤

副主编 郑庆功 李文华 李 伟

大连海事大学出版社

© 党坤 2013

图书在版编目(CIP)数据

轮机英语:管理级/党坤主编. — 大连:大连海事大学出版社, 2013.9  
中华人民共和国海船船员适任考试同步辅导教材  
ISBN 978-7-5632-2913-0

I. ①轮… II. ①党… III. ①轮机—英语—职业培训—教材 IV. ①H31

中国版本图书馆 CIP 数据核字(2013)第 217724 号

大连海事大学出版社出版

地址:大连市凌海路1号 邮编:116026 电话:0411-84728394 传真:0411-84727996

<http://www.dmupress.com> E-mail: cbs@dmupress.com

大连华伟彩色印刷有限公司印装

大连海事大学出版社发行

2013 年 9 月第 1 版

2013 年 9 月第 1 次印刷

幅面尺寸:185 mm × 260 mm

印张:33.25

字数:660 千

印数:1~3000 册

出版人:徐华东

责任编辑:陈 亮

版式设计:海 大

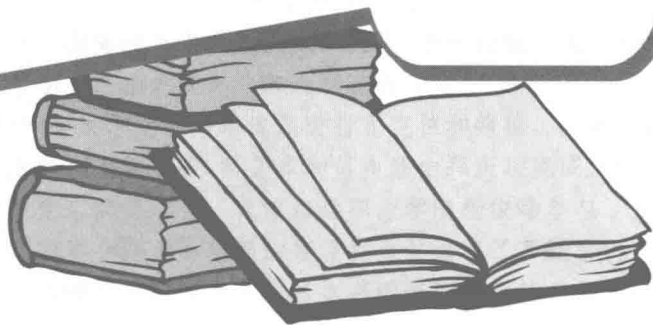
封面设计:王 艳

责任校对:张 慧

ISBN 978-7-5632-2913-0 定价:73.00 元

## 内 容 提 要

本书为《中华人民共和国海船船员适任考试培训教材》的同步辅导教材,内容和结构严格按照《中华人民共和国海船船员适任考试大纲》编写。全书分5章:第1章为船舶主推进装置,第2章为船舶辅助机械,第3章为船舶电气和自动化,第4章为船舶轮机管理业务,第5章为国际公约、规则。本书可作为750 kW及以上海船船舶轮机长、大管轮适任考试培训用书,也可供相关院校轮机专业师生教学参考使用。





## 编者的话



现代技术的日益进步与船舶设备的日趋电子化、网络化、智能化,对船舶设备管理人员提出了越来越高的要求。2010年6月在马尼拉通过的STCW公约修正案已于2012年1月1日生效,新的《中华人民共和国海船船员适任考试和发证规则》(“11规则”)已于2012年3月1日实施。根据STCW公约马尼拉修正案,中国海事局组织海事管理机构及海事院校专家对海船船员适任考试大纲进行了修订,并于2012年7月1日起实施。

为满足供职于无限航区和沿海航区750 kW及以上船舶高级船员参加适任考试的需要,大连海事大学出版社组织相关领域的专家和教师编写了本套《中华人民共和国海船船员适任考试同步辅导教材》。编者根据新考纲,将经典练习题进行排序定位,删除错误的题目和不在大纲范围内的练习题,并增加了部分新题,分别整理为《轮机英语(操作级)》和《轮机英语(管理级)》,分别适用于二/三管轮和大管轮/轮机长适任考试前针对性练习。本书为管理级部分。

本书由党坤主编,郑庆功、李文华、李伟任副主编,杨俊峰参与了部分书稿的编写工作。党坤以新考纲为基础对大部分单选题进行了定位,删除重复练习题后形成了本书初稿。在此基础上,郑庆功、李文华对新增单选题进行了定位和筛检。编者对部分练习题进行了审校及修改,第1章和第5章由李伟完成,第2章和第4章由郑庆功完成,第3章由李文华完成。少量疑难练习题由集体讨论后决定取舍。天津海运职业学院杨俊峰参与了第2章至第5章新增练习题的编审。附录部分简要介绍了关联题的题目类型并给出了真题实例,由郑庆功整理、编辑。

本书练习题主要来源包括本书编者所编的练习题,原大连海事大学轮机学院杨选材老师所编的练习题,编者从美国海岸警卫队轮机员考试题库、英国船员考试题库以及澳大利亚 Waterhouse Maritime Training Center 摘选的练习题。

特别感谢大连海事大学轮机学院各级领导,特别是吴桂涛副院长、李斌老师和张兴彪老师,培训班周利、吴焕发、刘健和王鑫同学,大连海事大学出版社的领导和编辑老师,以及始终给以厚爱的学生及船员朋友的大力支持。

因编者水平有限,书中若有不当之处,恳请读者谅解并给予指正。

编者

2013年6月



# 目 录



第1章 船舶主推进装置	1
第1节 船舶动力装置概述	1
1.1.1 船舶动力装置的组成	1
1.1.2 船舶动力装置的类型	4
第2节 船舶柴油机装置	6
1.2.1 基本特性指标	6
1.2.2 船舶柴油机的工作原理和基本结构(仅适用于大管轮)	9
1.2.3 船舶柴油机燃油系统	59
1.2.4 船舶柴油机滑油系统	71
1.2.5 船舶柴油机冷却水系统	81
1.2.6 船舶柴油机启动空气系统	91
1.2.7 船舶柴油机的操纵系统和控制系统	96
1.2.8 船舶柴油机的运行管理	102
1.2.9 船舶柴油机的故障分析和排除	133
1.2.10 现代船舶柴油机的结构特点	167
第3节 船舶推进装置	174
1.3.1 推进装置的传动方式	174
1.3.2 传动轴系的布置和结构	175
1.3.3 定距桨和调距桨装置	179
1.3.4 船舶在各种航行条件下的工况管理	182
1.3.5 推进装置的管理	185
第2章 船舶辅助机械	187
第1节 船用锅炉	187
2.1.4 船用锅炉的故障分析和排除	187
第2节 船用泵	193
2.2.3 船舶通用泵系的布置原则和特点	193





2.2.4	常见船用泵的运行管理和故障排除 .....	197
第3节	船舶制冷和空调装置 .....	204
2.3.1	制冷原理和制冷循环(仅适用于大管轮) .....	204
2.3.2	船舶制冷系统的组成及主要设备 .....	211
2.3.3	船舶空调系统的组成及主要设备(仅适用于轮机长) .....	217
2.3.4	船舶制冷装置的运行管理 .....	221
2.3.5	船舶空调装置的运行管理(仅适用于轮机长) .....	228
2.3.6	船舶制冷装置的故障分析和排除 .....	232
2.3.7	船舶空调装置的故障分析和排除(仅适用于轮机长) .....	241
第4节	船舶防污染设备 .....	242
2.4.1	油水分离器的工作原理及运行管理 .....	242
2.4.2	焚烧炉的工作原理及运行管理 .....	247
2.4.3	生活污水处理装置的工作原理及运行管理 .....	248
第5节	分油机、空压机和海水淡化装置 .....	251
2.5.1	分油机的工作原理及运行管理(仅适用于大管轮) .....	251
2.5.2	分油机的故障分析和排除 .....	261
2.5.4	空压机的故障分析和排除(仅适用于轮机长) .....	262
2.5.6	海水淡化装置的主要设备和运行管理(仅适用于轮机长) .....	264
第6节	船舶甲板机械 .....	267
2.6.1	液压泵、控制阀件和油马达的结构特点 .....	267
2.6.2	起货机的结构特点及其故障分析和排除(仅适用于轮机长) .....	274
2.6.3	锚机的结构特点及其故障分析和排除(仅适用于轮机长) .....	278
2.6.4	绞缆机的结构特点及其故障分析和排除(仅适用于轮机长) .....	279
2.6.5	舵机的工作原理及结构特点(仅适用于轮机长) .....	282
2.6.6	舵机的故障分析和排除 .....	290
2.6.7	液压系统管理 .....	291
第3章	船舶电气和自动化 .....	298
第1节	船用发电机 .....	298
3.1.1	船用发电机的结构特点(仅适用于轮机长) .....	298
3.1.2	船用发电机的并车和解列(仅适用于轮机长) .....	306
3.1.3	船用应急发电机 .....	314
第2节	船用配电板 .....	315
3.2.1	主配电板的组成 .....	315
3.2.2	应急配电板 .....	319
3.2.3	配电箱(仅适用于轮机长) .....	320
第3节	船舶电气设备 .....	320
3.3.1	船舶电气设备 .....	320
3.3.2	电气控制设备 .....	330



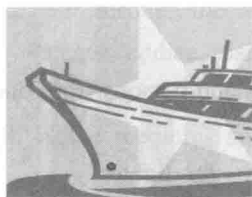
3.3.3 电气设备运行管理 .....	335
第4节 船舶自动化 .....	352
3.4.1 自动控制基本原理 .....	352
3.4.2 自动控制仪表 .....	357
3.4.3 典型的自动控制系统 .....	359
3.4.4 集中监视和报警系统 .....	361
3.4.5 无人机舱的基本含义及功能要求 .....	363
3.4.6 船舶计算机网络基础 .....	364
第4章 船舶轮机管理业务 .....	366
第1节 操作规程 .....	366
4.1.1 备车 .....	366
4.1.2 巡回检查 .....	372
4.1.3 完车 .....	377
第2节 安全管理知识 .....	379
4.2.1 轮机部操作安全注意事项 .....	379
4.2.2 船舶防火防爆的措施及守则 .....	391
4.2.3 机舱应急设备的使用及管理 .....	413
4.2.4 船员个人安全知识 .....	420
第3节 油料、物料和备件的管理 .....	428
4.3.1 燃油的管理(仅适用于轮机长) .....	428
4.3.2 润滑油的管理 .....	442
4.3.3 物料和备件的管理 .....	449
第4节 船舶修理和检验 .....	452
4.4.1 修理的类别 .....	452
4.4.2 轮机坞修工程 .....	456
4.4.3 试验与试航 .....	458
4.4.4 船舶检验的类别与作用 .....	460
4.4.5 轮机设备检验证书(仅适用于轮机长) .....	461
第5节 防污染管理及PSC检查 .....	463
4.5.1 海洋环境保护知识 .....	463
4.5.2 《油类记录簿》与IOPP证书的管理 .....	467
4.5.3 PSC检查中的明显理由与更详细检查 .....	472
4.5.4 PSC检查报告和缺陷的纠正 .....	478
第6节 机舱资源管理的基本知识 .....	479
第5章 国际公约、规则 .....	484
第1节 STCW公约 .....	484
5.1.1 轮机值班的基本原则 .....	484
5.1.2 轮机员的基本职责和道德 .....	487







5.1.3 驾机联系制度 .....	489
第2节 MARPOL 公约 .....	490
5.2.1 MARPOL 公约中有关污染物的排放规则 .....	490
5.2.2 有关国家、港口的防污染规则 .....	494
第3节 SOLAS 公约 .....	496
5.3.1 SOLAS 公约的基本精神和基本原则 .....	496
5.3.2 SOLAS 公约的主要内容 .....	502
5.3.3 ISM 规则 .....	503
5.3.4 ISPS 规则简介 .....	506
第4节 ILO 公约及其他公约和规则 .....	511
5.4.1 ILO 公约 .....	511
5.4.2 其他最新公约和规则 .....	513
附录 关于关联题的说明 .....	515
轮机长示例题 1 .....	515
轮机长示例题 2 .....	516
大管轮示例题 1 .....	518
大管轮示例题 2 .....	519
参考文献 .....	521



# 第1章

## 船舶主推进装置

### 第1节 船舶动力装置概述



#### 1.1.1 船舶动力装置的组成

- With \_\_\_\_\_, the engine needs not to be aligned with reduction gears or propeller shaft.  
A. diesel engine propulsion      B. diesel electric propulsion  
C. steam engine propulsion      D. gas turbine propulsion
- The \_\_\_\_\_ engine is used for alternators and sometimes for main propulsion with a gearbox to provide a propeller speed of between 90 and 120 rpm.  
A. four-stroke      B. slow-speed      C. two-stroke      D. reversible
- Each type of engine has its applications, which on board ship have resulted in the slow-speed main propulsion diesel operating \_\_\_\_\_ cycle.  
A. on four-stroke      B. both on two-stroke and on four-stroke  
C. on two-stroke      D. either on two-stroke or on four-stroke
- Most often \_\_\_\_\_ is attached to the engine-propeller shaft for efficient electric power generation.  
A. a variable-speed AC generator      B. a fixed-speed AC generator  
C. an air blower      D. a DC generator
- The slow-speed main propulsion diesel operates on two-stroke cycle. At this low speed the engine requires no reduction gear box between it and \_\_\_\_\_.  
A. thrust blocks      B. flying wheel      C. propeller      D. rudder
- When the piston is pushed down, it forces the engine to do work on the crankshaft which in turn drives \_\_\_\_\_.  
A. the ship's rudder      B. the turning gear  
C. the ship's propeller      D. the thrust bearing
- Typical marine propulsion plants include \_\_\_\_\_ directly coupled to the vessel's single large-





diameter, fixed-pitch propeller.

- A. a single acting, long-stroke, slow-speed, turbocharged, two-stroke diesel engine  
B. a single acting, long-stroke, medium-speed, turbocharged, four-stroke diesel engine  
C. two, medium-speed, turbocharged, four-stroke diesel engines  
D. a variable-speed AC generator
8. The term "ship" is used to denote a \_\_\_\_\_ employed to transport goods and persons from one point to another over water.  
A. barge                      B. vehicle                      C. tank                      D. lighter
9. Ship propulsion normally occurs with the help of a \_\_\_\_\_, which is the term most widely used in English, although the word "screw" is sometimes seen, *inter alia* in combinations such as a "twin-screw" propulsion plant.  
A. thruster                      B. screw                      C. rivet                      D. propeller
10. Today, the primary source of propeller power is the \_\_\_\_\_, and the power requirement and rate of revolution very much depend on the ship's hull form and the propeller design.  
A. diesel engine                      B. steam turbine  
C. gas turbine                      D. nuclear plant
11. The three largest categories of ships are container ships, \_\_\_\_\_ (for bulk goods such as grain, coal, ores, etc.) and tankers, which again can be divided into more precisely defined classes and types.  
A. bulk carriers                      B. general cargo ships  
C. passenger ships                      D. reefers
12. When a ship in loaded condition floats at an arbitrary water line, its displacement is \_\_\_\_\_ the relevant mass of water displaced by the ship.  
A. larger than                      B. less than                      C. equal to                      D. twice as large as
13. Displacement comprises the ship's light weight and its deadweight, where the \_\_\_\_\_ is equal to the ship's loaded capacity, including bunkers and other supplies necessary for the ship's propulsion.  
A. displacement                      B. light weight                      C. heavy weight                      D. deadweight
14. Besides the metric ton (1,000 kg), there is the English ton (1,016 kg), which is also called the "\_\_\_\_\_".  
A. long ton                      B. short ton                      C. middle ton                      D. cold ton
15. The light weight of a ship is not normally used to indicate the size of a ship, whereas the \_\_\_\_\_, based on the ship's loading capacity, including fuel and lube oils, etc. for operation of the ship, measured in tons at scantling draught, often is.  
A. displacement tonnage                      B. light weight tonnage  
C. heavy weight tonnage                      D. deadweight tonnage
16. The influence of frictional and residual resistances depends on how much of the hull is \_\_\_\_\_ the waterline, while the influence of air resistance depends on how much of the ship is

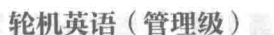


- \_\_\_\_\_ the waterline.
- A. below/above      B. below/below      C. above/below      D. above/above
17. Wave resistance refers to the energy loss caused by waves created by the vessel during its propulsion through the water, while eddy resistance refers to the loss caused by flow separation which creates eddies, particularly at the \_\_\_\_\_ of the ship.
- A. aft end      B. fore end      C. middle      D. deck
18. Some medium- and high-speed diesel engines require reduction gear units to provide a useful propeller speed. In most reduction gears, the bull gear \_\_\_\_\_.
- A. must churn the oil in the sump  
B. is connected to the propeller shaft  
C. is driven at the highest rpm  
D. compensates for alignment variations between the engine and pinion gear
19. When used with reversing reduction gears, medium-speed diesel engines should be bolted to their foundations with fitted bolts at the drive end and clearance (loosely fitted) bolts in other locations. This is done to \_\_\_\_\_.
- A. maintain alignment when the ship's hull is working in heavy seas  
B. ensure engine vibrations correspond to the natural frequency of the hull  
C. permit the engine to expand away from the driven equipment as the engine heats up and expands  
D. maintain engine thrust bearing clearances
20. Pitting in the area close to the pitch line and on the same end of each gear tooth of a reduction gear unit would be caused by \_\_\_\_\_.
- A. corrosion on the gears      B. excessive gear speed  
C. dirt in the oil      D. misalignment of the gears
21. Since most medium-speed diesel engines are non-reversible, what is usually used to cater for astern thrust?
- A. A reversing gear.      B. A controllable pitch propeller.  
C. A fixed pitch propeller.      D. A clutch.

### 参考答案

1. B    2. A    3. C    4. A    5. C    6. C    7. A    8. B    9. D    10. A  
11. A    12. C    13. D    14. A    15. D    16. A    17. A    18. B    19. C    20. D  
21. B





1. \_\_\_\_\_ are increasingly used as main engine on merchant vessels, because they have a high Hp/Weight ratio.  
A. Slow-speed diesel engines                      B. Medium-speed diesel engines  
C. Steam engines                                      D. Gasoline engines
2. Propulsion of the vast majority of contemporary merchant ships (especially containerhips and VLCCs) utilizes \_\_\_\_\_ as prime mover.  
A. gas turbine                      B. diesel engine                      C. steam engine                      D. gasoline engine
3. As a heat engine, \_\_\_\_\_ energy is the source of power by which the diesel engine can be operated.  
A. electric                      B. mechanical                      C. heat                      D. exhaust
4. The diesel engine is a type of \_\_\_\_\_.  
A. turbine engine                      B. steam engine  
C. gas turbine                      D. internal combustion engine
5. We call a ship equipped with diesel main engine "\_\_\_\_\_".  
A. a tug boat                      B. an oil tanker                      C. a salvage ship                      D. a motor vessel
6. The term medium-speed diesel engine is currently taken to mean an engine with an operating rotational speed of \_\_\_\_\_ rpm.  
A. below 300                      B. above 1,000  
C. between 300 and 1,000                      D. below 1,000
7. The majority of medium-speed and high-speed marine diesel engines for main or auxiliary drive operate on \_\_\_\_\_ cycle.  
A. two-stroke                      B. ling-stroke                      C. four-stroke                      D. short-stroke
8. If a diesel engine operates at about 700 rpm, then what is it known as?  
A. A slow-speed diesel engine.                      B. A high-speed diesel engine.  
C. A medium-speed diesel engine.                      D. None of the other alternatives.
9. Hitachi B&W, 2-stroke, single acting direct reversible, crosshead, welding design type diesel engine with turbocharger. These information refers to \_\_\_\_\_.  
A. the type of a pump                      B. the type of an auxiliary equipment  
C. the type of a turbocharger                      D. the type of a diesel engine
10. Of all types of commercial internal combustion engines now built, which one usually gives the best performance, and hence it is quite commonly used in marine applications, especially in larger sizes?  
A. Steam engine.                      B. Gasoline engine.                      C. Gas turbine.                      D. Diesel engine.
11. Diesel engines instead of steam engines were used as main engine on board ships is mainly because \_\_\_\_\_.





轮机专业

- A. they have high mechanical efficiency
  - B. they have high thermal efficiency
  - C. they are more reliable
  - D. they are simple in construction
12. Among the main propulsion units on board the ship with the same capacity, the lightest one is \_\_\_\_\_.
- A. steam engine
  - B. steam turbine
  - C. gas turbine
  - D. diesel engine
13. \_\_\_\_\_ can be found on most medium to large merchant vessels even if the main engine is either a steam turbine or 2-stroke crosshead engine.
- A. The medium-speed, 4-stroke trunk piston engine
  - B. The slow-speed, 2-stroke crosshead engine
  - C. The medium-speed, 2-stroke crosshead engine
  - D. The slow-speed, 4-stroke trunk piston engine
14. Gas turbines differ from steam turbines in that \_\_\_\_\_.
- A. steam rather than gas is used to turn a shaft
  - B. vapor rather than gas is used to turn a shaft
  - C. the former uses gas to turn a shaft
  - D. the latter uses gas to turn a shaft
15. A ship designed for carrying goods requiring refrigeration is called \_\_\_\_\_.
- A. reefer
  - B. ro/ro ship
  - C. container ship
  - D. tanker
16. The abbreviation "M/E" is used to represent the \_\_\_\_\_.
- A. measure equipment
  - B. main electrical
  - C. my engine
  - D. main engine
17. What determines the number of events occurring in a cycle of operation in an internal combustion engine?
- A. Crankshaft revolution.
  - B. Type of engine (diesel or gasoline).
  - C. Distance a piston travels during a stroke.
  - D. Number of pistons.

## 参考答案

1. B    2. B    3. C    4. D    5. D    6. C    7. C    8. C    9. D    10. D  
11. B    12. C    13. A    14. C    15. A    16. D    17. B





## 第2节 船舶柴油机装置



### 1.2.1 基本特性指标

- The abbreviation "MIP" stands for \_\_\_\_\_.  
A. middle indicating pressure      B. mean indicated pitch  
C. mean indicated pressure      D. middle indicated power
- Which of the following can be obtained by means of an indicator card?  
A. The peak pressure in a cylinder.      B. The fuel consumption.  
C. The temperature of the cooling water.      D. None of the other alternatives.
- The distance between TDC and BDC of the diesel engine is called a \_\_\_\_\_.  
A. gap      B. radius      C. clearance      D. stroke
- Energy losses due to \_\_\_\_\_ occur in every machine.  
A. speed      B. impact      C. friction      D. atmosphere
- The mechanical efficiency of an engine \_\_\_\_\_ because losses occur in the form of friction.  
A. is always less than 100%      B. is always equal to 90%  
C. is always more than 100%      D. is always less than 90%
- Which of the following statements is not true?  
A. The slow-speed engine is the most common diesel engine throughout the world.  
B. The majority of high-speed engines operate on the 4-stroke cycle.  
C. High speed engines are suitable for driving trucks and buses.  
D. If the rotational speed of an engine is over 1,200 rpm, then it is a high-speed diesel engine.
- The main factor determining the output of each cylinder is the cylinder \_\_\_\_\_.  
A. density      B. bore      C. weight      D. material
- The rotating range of the slow-speed diesel engine is usually lower than \_\_\_\_\_.  
A. 100 rpm      B. 200 rpm      C. 300 rpm      D. 500 rpm
- \_\_\_\_\_ the compression ratio, \_\_\_\_\_ the proportion of the heat energy of the combustion turned into useful work at the crankshaft, other things being equal.  
A. The high/the large      B. The higher/the larger  
C. The lower/the larger      D. The low/the large
- Suppose the rated capacity of the main engine of a ship is 10,000 kW at 100 rated rpm, then when at 80 rpm its capacity should be \_\_\_\_\_.  
A. 800 kW      B. 5,120 kW      C. 6,400 kW      D. 4,180 kW
- The minimum speed an engine must attain before ignition can occur depends upon \_\_\_\_\_.  
A. the type and size of the engine      B. the condition of the engine  
C. ambient temperature      D. any one of the other alternatives





12. Maximum horsepower of a diesel engine is attained \_\_\_\_\_.  
A. when the engine rpm is pulled down by overload  
B. at rated engine rpm  
C. at 95% of rated engine rpm  
D. at 95% of a properly adjusted governor rpm with the engine under full load
13. "AMIDSHIPS" refers to \_\_\_\_\_.  
A. the back of the vessel  
B. the middle portion of a ship  
C. a backward movement of a vessel  
D. across the ship, at right angles to the fore-and-aft centerline
14. The order "\_\_\_\_\_" means "maximum maneuvering engine revolution for ahead propulsion".  
A. Full Ahead      B. Half Ahead      C. Full Astern      D. Half Astern
15. The ratio of the brake horsepower to the indicated horsepower of a diesel engine is its \_\_\_\_\_.  
A. thermal efficiency      B. mechanical efficiency  
C. brake thermal efficiency      D. volumetric efficiency
16. The bore of a diesel engine cylinder describes the \_\_\_\_\_.  
A. swept volume of the cylinder      B. inside diameter of the cylinder  
C. piston displacement in the cylinder      D. length of the piston stroke
17. A mixture of 45% cetane and 55% alpha-methyl-naphthalene is found to have the same ignition delay as a sample of diesel oil. The sample can be described as having a/an \_\_\_\_\_.  
A. cetane number of 55      B. cetane number of 45  
C. octane number of 55      D. octane number of 45
18. The cubic inch (or liter) displacement of a cylinder is determined by the diameter of the piston and the \_\_\_\_\_.  
A. length of the crankshaft      B. volume of the clearance space  
C. weight of the piston      D. length of the stroke
19. The most important factor in engine performance is the actual power output at the end of the crankshaft available for doing work. This is known as \_\_\_\_\_.  
A. indicated horsepower      B. brake horsepower  
C. net horsepower      D. friction horsepower
20. Which of the following can be obtained by means of an indicator card?  
A. Power.      B. Mean pressure in a cylinder.  
C. Maximum pressure in a cylinder.      D. Any one of the other alternatives.
21. The efficiency of a two-stroke main engine particularly depends on \_\_\_\_\_.  
A. the ratio of the minimum pressure and the mean effective pressure  
B. the ratio of the mean pressure and the mean effective pressure  
C. the ratio of the mean pressure and the maximum effective pressure







- D. the ratio of the maximum pressure and the mean effective pressure
22. It is a verified fact that the higher \_\_\_\_\_ of a two-stroke engine, the higher \_\_\_\_\_.  
A. the engine efficiency / the stroke/bore ratio  
B. the stroke/bore ratio / the engine efficiency  
C. the bore/stroke ratio / the engine efficiency  
D. the engine efficiency / the bore/stroke ratio
23. The main engine's 75% \_\_\_\_\_ figure is as standard applied in the calculation of the \_\_\_\_\_ figure, in which also the CO<sub>2</sub> emission from the auxiliary engines of the ship is included.  
A. EEDI/SMCR    B. SFOC/EEDI    C. SMCR/EEDI    D. SMCR/SFOC
24. One of the goals in the marine industry today is to reduce the impact of CO<sub>2</sub> emissions from ships and, therefore, to reduce the \_\_\_\_\_ for the propulsion of ships to the widest possible extent at any load.  
A. fuel consumption    B. lube oil consumption  
C. fresh water consumption    D. spare parts consumption
25. Based on an average reference CO<sub>2</sub> emission from existing container vessels, the CO<sub>2</sub> emission from new container vessels in gram per dwt per nautical mile must be \_\_\_\_\_ the reference emission figures valid for the specific container vessel.  
A. equal to or lower than    B. larger than  
C. independent of    D. dependent upon
26. A more technically advanced development drive includes optimizing the aft body of the ship, making it possible to install propellers with a larger propeller diameter and, thereby, obtaining \_\_\_\_\_ propeller efficiency, but at a \_\_\_\_\_ optimum propeller speed.  
A. higher/reduced    B. higher/increased  
C. lower/reduced    D. lower/increased
27. EEDI represents the amount of \_\_\_\_\_ in gram emitted when transporting one deadweight tonnage of cargo one nautical mile.  
A. carbon monoxide    B. carbon dioxide  
C. exhaust gases    D. NO<sub>x</sub>
28. In general, the larger the propeller diameter, the \_\_\_\_\_ the propeller efficiency and the \_\_\_\_\_ the optimum propeller speed referring to an optimum ratio of the propeller pitch and propeller diameter.  
A. higher/higher    B. higher/lower    C. lower/lower    D. lower/higher
29. The efficiency of a two-stroke main engine particularly depends on the ratio of the maximum (firing) pressure and the mean effective pressure. The higher the ratio, the \_\_\_\_\_ the engine efficiency, i. e. the \_\_\_\_\_ the Specific Fuel Oil Consumption (SFOC).  
A. higher/higher    B. higher/lower    C. lower/lower    D. lower/higher

