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**Q 2395**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Second Semester

Civil Engineering

ME 151 — MECHANICAL ENGINEERING

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define "Mechanical Advantage" in a lifting machine.
2. What do you understand by rotary drilling?
3. What is the function of piston in an IC engine?
4. Draw the diesel cycle on a p-v and T-s diagrams, indicating all the processes.
5. What are the disadvantages of a hydro-electric power plant?
6. Name the various fuels used in a nuclear reactor.
7. What are the main constituents of a moulding sand.
8. Name the furnace used for producing cast iron and write down the various zones in the furnace.
9. What is "Oxidizing flame" in welding?
10. Write a note on "submerged arc welding".

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss any two types of lifting machines with the help of neat sketches. (8)
- (ii) Discuss the trouble shooting and maintenance procedures of rock drilling machines. (8)

Or

- (b) Find the law of a machine in which an effort of 15.5 N raised a load of 70 N and an effort of 19.5 N raised a load of 90 N. Find what effort is required to lift a load of 100 N? What is the maximum mechanical advantage?
12. (a) (i) Explain with neat sketch the working of a four-stroke diesel engines. (12)
- (ii) Compare internal combustion engines with external combustion engines. (4)

Or

- (b) How diesel engines are used in the generation of electricity? List down its advantages and disadvantages.
13. (a) Explain with a neat sketch the principle of operation of a "Solar thermal power plant".

Or

- (b) Explain the various non-conventional sources of energy stating their availability.
14. (a) (i) Explain the green house effect. (8)
- (ii) Explain Ozone depletion and its consequences. (8)

Or

- (b) Explain the various steps involved in preparation of a "shell mould".

15. (a) Explain the following methods in "testing of castings" :

- (i) Radio-graphical testing (4)
- (ii) Magnetic testing (4)
- (iii) Liquid-penetrant inspection (4)
- (iv) Ultrasonic testing (4)

Or

- (b) (i) Why cleaning of a joint is important before welding? (3)
- (ii) Explain "Gas welding equipment" with a neat sketch. (13)