* S E - 6 0 0 3 / 5 0 0 *

SE-6003

B. E. I (Sem. I) Examination

March / April – 2011

Basic Mechanical System

(All Branches)

Time : Hours] [Total Marks :

Instructions :

(1) નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ B. E. 1 (Sem. 1) All Branches

Name of the Subject :

☛ Basic Mechanical System

☛ Subject Code No. : 6 0 0 3 ☛ Section No. (1, 2,.....) : 1, 2

Seat No. :

Student's Signature

(2) Attempt all the questions.

(3) Figures to the right indicate full marks.

(4) Assume data wherever necessary.

(5) Use of non-programable calculator is permitted.

SECTION - I

1 (a) Attempt all questions. **10**

(1) An example of a fire tube boiler is _____. (Bension boiler, Velox boiler, Loettler boiler, Locomotive boiler)

(2) The fire tubes in a Cochran boiler are kept _____. (verticle, horizontal, inclined)

(3) In an externally fired boiler, position of furnace is _____. (inside, outside, any other)

(4) The water level indicator is used to _____. (feed a water, indicate a water level, indicate a pressure, indicate a temp.)

(5) Air standard efficiency of otto cycle is expressed as : _____.

$$\left[1-\frac{1}{r^{\gamma-1}}, 1-\left(\frac{1}{r}\right)^{\frac{\gamma-1}{\gamma}}, 1-\frac{1}{r^{\frac{1}{\gamma-1}}}, \left(1-\frac{1}{r}\right)^{\frac{\gamma}{\gamma-1}}\right]$$

(6) In a two-stroke cycle engine, one power stroke is obtained in following number of revolution of cranskshaft is _____. (1/2, 1, 2, 4)

(7) In a diesel engine, the fuel is ignited by _____. (spark plug, ignitor, carburettor, compressed air temperatue)

(8) ^{233}U is a _____ material. (fertile, fissile)

(9) In low head hydro-electric plants, Kaplan turbine is used. (Write a statement is true or false)

(10) Diesel engine is _____ efficient than gas turbine power plant. (more, less, equal)

(b) (a) Explain with neat sketch of working of Locomative boiler. **8**

(b) Write a function of : water level indicator, pressure gauge. **2**

OR

(b) (a) Explain with neat sketch superheater. **6**

(b) Write a shot note on : steam stop valve. **4**

2 (a) Explain with neat sketch the working of four-stroke cycle diesel engines. **7**

(b) Comparison between petrol engine an diesel engine. **3**

(c) Write a short note on a spark plug. **5**

OR

(c) A single cylinder four-stroke engine has a bore of 120 mm and stroke is 150 mm. The engine runs at 1000 rpm. If the mean effective pressure is $600 \times 103 N/m^2$. find the indicated power of the engine. **5**

3 (a) Describe with sketch the hydro power plant. **10**

(b) Write comparison between pressure water reactor (PWR) and boiling water reactor (BWR). **5**

OR

(b) List the advantages of gas turbine power plant over diesel power point. **5**

SECTION - II

Instructions : (2) Attempt all the questions.
(3) Figures to the right indicate full marks.
(4) Assume data wherever necessary.
(5) Use of non-programable calculator is permitted.

4 (a) Answer the following : **10**

(1) Define : Calorific value.

(2) 1 ton= _____ kcal/min.

(3) Arbor is a part of milling m/c. True of false.

(4) The power of wind is proportional to _____ of wind speed. (cube, square)

(5) Define : Air conditioning.

(6) Define : Konicity.

(7) Mechanical energy is a high grade energy. (true or false)

(8) Define : C.O.P.

(9) Tail stock is a part of drilling m/c : True of False.

(10) Knurling operation is done on_____ m/c.

(b) Give advantages & disadvantages of gaseous fuels. **5**

(c) Explain working of window type air-conditioner. **5**

5 (a) Give complete classification of fuels. **5**

(b) Derive an equation for minimum amount of air required for complete combustion of the fuel. **5**

OR

(b) Find HCV and LCV of the following : **5**
C-76%, S-4%, O-10%, Moisture-4% Remaining Ash.

(c) Explain working of an Ice-plant. **5**

OR

(c) State desirable properties of ideal refrigerant. **5**

6 (a) Explain with neat sketch working of drilling m/c. **7**

OR

(a) Explain lathe m/c. with neat sketch. **7**

(b) Define following terms : **3**
(i) Reaming (ii) Facing (iii) Counter sinking.

OR

(b) Determine m/c time for plain turning operation if length of cut is 100 mm, speed of spindle is 5000 rpm and feed is 0.25 mm/rev. **3**

(c) Give classification of milling m/c. **5**
