* R M – 6 0 0 3 / 3 0 0 *

RM-6003

B. E. I (Sem. I) (All Branches) Examination

April / May – 2010

Basic Mechanical System

Time : Hours] [Total Marks : **100**

Instruction :

(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. I (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 questions.
(3) Use separate answer books for each section.
(4) Figures to the right indicate full marks.
(5) Assume suitable data & draw neat sketches if necessary.
(6) Use of non-programmable calculator is allowed.

1 (a) Fill up the correct answer in the blanks. **5**

(i) Babcock & Wilcox boiler is ____pressure boiler.
(ii) Water tube boilers are used mainly for_____
(iii) A petrol engine working on _____cycle.
(iv) A fuel injector is used_____engine.
(v) The fission rate is controlled by _____

(b) Match the correct combination. **15**

Match-A	Match-B
(i) Boiler Mounting	(ii) Koplan turbine
(ii) Boiler Accessories	(ii) Ports
(iii) Low-head hydel Power Plant	(iii) Pelton turbine
(iv) High-Head Hydel Power Plant	(iv) Air-preheater
(v) Two-Stroke Engine	(v) Feed check valve
	(vi) Francis Turbine

(c) Describe with neat sketch of working of Cochran boiler. **10**

OR

(c) (i) Write a short note on safety valve. **5**

(ii) Differntiate between Fire-Tube boiler and water tube boiler. **5**

2 Attempt any **three** : **15**

(i) Explain the working of simple carburettar.

(ii) Write a short note on ignition system.

(iii) Explain the working of four-stroke cycle petrol engine.

(iv) A rope brake has brake wheel diameter of 600 mm and the diameter of rope is 5 mm. The dead load on the brake is 210N and spring balance reads 30 N. If the engine makes 450 rpm, find the brake power developed.

3 (a) Describe with the sketch of closed cycle gas turbine power plant. **10**

(b) Explain about Moderator and Control rods. **5**

OR

(b) Classify Power Plants. **5**

SECTION - II

4 (a) Fill up the correct answer in the blanks. **5**

(i) _____is a by-product (waste) in the production of pig-iron in the blast furnace.

(ii) The refrigerent should have _____C.O.P. in working temp range (low, high).

(iii) Saddle is a part of _____machine.

(iv) The power of wind is proportional to _____of wind speed. (Square, cube)

(v) Knurling operation is done on _____machine.

(b) Match the following: **5**

(i) Quick Return Mechanism	(a) High grade energy
(ii) Wind energy	(b) lathe machine
(iii) Relative Humidity	(c) Horizontal lines.
(iv) Tail-stock	(d) Shaper machine
(v) Nuclear energy	(e) Curved lines
	(f) low grade energy.

(c) Write short note on geothermal energy. **4**

(d) What is refrigerent? What are the most widely used refrigerents? **3**

(e) What are the different types of drilling machine? **3**

5 (a) Give advantage and disadvantages of tidle power. **5**

OR

(a) Derive the equation to find out minimum amount of air required for complete combustion of fuel. **5**

(b) (i) Exlain with neat sketch window type air-conditioner. **7**

(ii) Define : **3**

(a) Theoretical C.O.P.

(b) Actual C.O.P.

(c) Relative C.O.P.

OR

(ii) Find C.o.P. of the refrigerator system if the lowest temp in the cycle is $-30^{o}C$ and highest temp is 57^{o} C. **3**

6 (a) Define C.V. Give classification of it. **3**

(b) Define : **2**

(i) Relative humidity

(ii) Human comfort.

(c) (i) Explain milling machine with neat sketch. **7**

(ii) Find the machining time to drill a hole of 10 mm diameter in a plate of thickness V 20 mm if rpm is 450 and feed is 0.05 mm /rev.

OR

(c) (i) Give specification of lathe machine. **4**

(ii) In a shaper, the length of stroke is 300 mm, no. of double stroke per min. is 35 and ratio of return time to cutting time is 2:3. Find the cutting speed.

(iii) Define : **3**

(a) Spot facing

(b) Boring

(c) Grinding.
