Total No. of Questions—**12**] [Total No. of Printed Pages—**3**

Seat No.	

[4956]-10

F.E. (Semester II) EXAMINATION, 2016
BASIC MECHANICAL ENGINEERING
(2008 PATTERN)

Time : Three Hours **Maximum Marks : 100**

N.B. :— (*i*) Assume suitable data, if necessary.
(*ii*) Figures to the right indicate full marks.
(*iii*) Neat diagrams must be drawn whenever necessary.
(*iv*) Use of non-programmable electronic Calculator is permitted.
(*v*) Answer of two sections should be written in separate answer-book.
(*vi*) Attempt *six* question. Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4, Q. No. 5 or Q. No. 6, Q. No. 7 or Q. No. 8, Q. No. 9 or Q. No. 10, Q. No. 11 or Q. No. 12

SECTION-I

1. (*a*) Draw P-V diagram and explain the work done in : [6]
(*i*) Constant Temperature Process
(*ii*) Constant Entropy Process.

(*b*) Explain various types of thermodynamic systems with example. [6]

(*c*) Explain the following devices :
Heat Engine and Heat Pump. [6]

Or

2. (*a*) Define and explain : Cp, Cv Pure Substance. [6]

(*b*) State different statements of first law of thermodynamics. Discuss its limitations. [6]

P.T.O.

(*c*) A household refrigerator with a COP of 1.5 removes heat from the refrigerated space at a rate of 90 kJ/min. Find electric power consumed by the refrigerator and rate of heat transfer to the kitchen air. Draw the sketch of the Regrigerator. [6]

3. (*a*) Explain the working of four-stroke petrol engine with neat sketch. [8]

(*b*) Draw block diagram of : [8]

(*i*) Open Cycle Gas Turbine

(*ii*) Centrifugal Pump.

Or

4. (*a*) State classification of boilers. Explain any *two* mountings and any *two* accessories. [8]

(*b*) Draw block diagram of : [8]

(*i*) Reciprocating air compressor

(*ii*) Reciprocating pump.

5. (*a*) Draw a layout for : [8]

(*i*) Wind power plant

(*ii*) Solar power plant.

(*b*) State and explain Newton's law of cooling and derive an expression for "Overall Heat Transfer coefficient for composite slab." [8]

Or

6. (*a*) Explain hydro-electric power plant with neat sketch. [8]

(*b*) State and explain Fourier's law of heat conduction. [4]

(*c*) Write a short note on thermal insulation. [4]

SECTION-II

7. State the function of following machine elements with neat sketch : [16]

(*i*) Transmission Shaft

(*ii*) Parallel key

(*iii*) Flywheel

(*iv*) Cross belt drive.

Or

8. (*a*) How are bearings classified ? Explain ball bearing with neat sketch. [8]

(*b*) Draw neat sketches of spur gear, helical gear, bevel gear, rack & pinion gear. [8]

9. (*a*) Explain general steps in design process. [8]

(*b*) Explain any *four* sheet metal working process. [8]

Or

10. (*a*) State properties and engineering applications of any *four* materials. [8]

(*b*) Explain sand casting process with neat sketch. [8]

11. (*a*) Describe any *two* operations on drilling machines. [6]

(*b*) Draw a neat sketch of power saw and state its application. [6]

(*c*) Draw neat sketches of any *three* operations performed on milling machines. [6]

Or

12. (*a*) Draw a block diagram of any drilling machine. [6]

(*b*) Explain surface grinding process with a neat sketch. [6]

(*c*) Describe any *two* operations performed on lathe machines. [6]