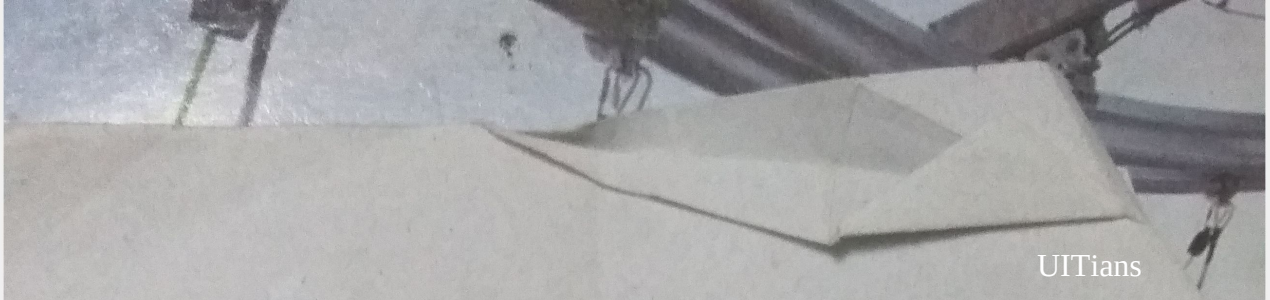

Total No. of Questions : 6 Total No. of Printed Pages : 4

EI-175

B.E. (Ist Sem.) (CGPA) Civil Engg. Exam.-2015

BASIC MECHANICAL ENGINEERING

Paper : CE-104

Time Allowed : Three Hours
Maximum Marks : 60

Note : Attempt all questions.
Use of steam table is permitted.
Use neat and clean diagram wherever required.

Q.I Fill in the blanks— 2 each

(a) A mixed phase of liquid and gas is called .....

(b) Compression ratio of diesal engine may have a range ..... .

(c) Air refrigerator cycle works on ..... cycle.

(d) For wire drawing operation the work material should be .....

(e) ..... is a process of joining two materials with the help of hea pressure or by some other means.

Q.II (a) Explain—

(i) Super heat

(ii) Latent heat

(iii) Internal energy

(iv) Super heated steam

(b) Draw a neat sketch of throttling calorimater and explain how dryness fraction of steam is determined; clearly explain its limitations. 6

or

(a) Draw and explain lanchshire boiler. 5

(b) A spherical shell of 30 cm in radius contains saturated steam and water at 300°C. Calculate the mass of each if their volumes are equal. 5

Q.III (a) Explain the classification of combustion engines. 4

(b) A four cylinder two stroke cycle petrol engine develops 23.5 kw brake power at 2500 rpm. The mean effective pressure on each piston is 8.5 bar and the mechanical efficiency is 85%. Calculate the diameter and stroke of each cylinder, assuming the length of stroke equal to 1.5 times the diameter of cylinder. 6

Contd. .....

or

(a) Define volumetric efficiency for an I.C. engine. What is the effect of volumetric efficiency on—4

(i) Engine power

(ii) Specific fuel consumption

(d) Explain with the help of suitable sketches, the working of a four stroke cycle diesel engine. 6

Q.IV (a) Explain the difference between summer and winter air conditioning in brief. 4

(b) Define the following terms—

(i) Thermal conductivity

(ii) Overall coefficient

(iii) Temperature gradient

or

(a) Give some examples to illustrate importance of heat transfer in the field of engineering. 3

(b) What is the need and application of air conditioning. 2

(c) Drive an expression for the quantity of heat flow through a thick cylindrical pipe. 5

Q.V (a) Explain the construction and working of shaper machine. 5

(b) Explain the following mechanical properties of materials— 3

(i) Toughness
(ii) Fatigue
(iii) Duetity
(iv) Strength

(c) Give classification of steel. 2

or

(a) What are the different operations can performed on lathe machine. 5

(b) Draw labelled diagram of micrometer and explain construction and working. 5

Q.VI (a) Differentiate between the following— 6

(i) TIG and MIG welding
(ii) Sand and permanent mould
(iii) Chills and chaplets

(b) Explain gas welding and flame used in brief. 4

or

Write short notes (any four)— 10

(a) Welding defects
(b) Pattern allowance
(c) Types of welding joints
(d) Properties of moulding sand
(e) Brazing, soldering and braze welding
(f) Types of electrodes and polarity in welding

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