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B.E. Ist Semester (CGPA) Inform. Tech.

Examination, 2019

Basic Mechanical Engg.

Paper - IT - 105

Time : 3 Hours]

[Maximum Marks : 60

Note :- Attempt all questions. All questions carry equal marks.

Use of steam table is permitted. Use neat and clean diagram wherever required.

1. (a) What are steam boilers ? How are boilers classified. 6
- (b) Explain the construction and working of Babcock and Wilcox boiler. 6

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(1)

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OR

- (a) State the first law of thermodynamics. Write its mathematical expression for a process and cyclic process.
- (b) A vessel having a volume of 0.6 m^3 contains 3.0 kg of water and water vapours mixture in equilibrium at a pressure of 0.5 mpa calculate
- (i) Mass and volume of fluid.
 - (ii) Mass and volume of vapour
2. (a) Enlist the advantages and disadvantages of a 2 stroke engine and a 4 stroke engine. 6
- (b) Explain the following :- 6
- (i) Kelvin-planck statement.
 - (ii) Clausius statement of the second law of thermodynamics.

OR

- (a) Explain with the suitable diagram the working of 2 stroke petrol engine. 6
- (b) A four cylinder engine running at 1200 rpm gave 18.6 when one cylinder was cut out 105 N-M . Determine

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(2)

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the indicated thermal efficiency if the calorific value of the fuel is 42000 KJ/Kg and engine uses 0.34 Kg of petrol per brake power horse. 6

3. (a) What are the fourier's law of heat conduction ? 6
(b) Draw a neat diagram and explain working of winter air conditioning system. 6

OR

- (a) Define the overall coefficient of heat transfer. How do you define the thermal conductivity of a material. 6
(b) Explain the working of summer air conditioning system ? 6
4. (a) Explain briefly with suitable example the following mechanical properties 4
(i) Ductility
(ii) Tonghness
(iii) Malleability
(iv) Hardness
- (b) Differentiate between steel and cast Iron. 4
(c) What is sine bar ? None the materials of which it is made up of.

OR

(a) Explain the construction and working a drill machine with a well labelled sketch. 6

(b) Write short note on :-

(i) Surface plate

(ii) High speed steel

5. (a) What is moulding ? Explain the different types of moulds. 6

(b) Explain the process of metal are welding with its advantages and limitation. 6

OR

(a) Differentiate between :- 6

(i) Air welding and gas welding

(ii) Soldering and Brazing

(b) What are the different allowances provided on pattern.
