Roll No. 2382300084

Total No. of Questions : 6] [Total No. of Printed Pages : 6

EX-72

B.Tech. Ist Semester (CSE, IT & Electronics)

Examination, 2022-23

Basic Mechanical Engineering

Paper - BE - 104

Time : 3 Hours] **[Maximum Marks : 60**

Note : -Answer all questions. All questions carry equal marks. Assume missing/misprint data suitably. Use of steam table is permitted. Answer all parts of a question at one place only.

1. This questions contains five sub-questions. For each sub-question, four possible answers are given, out of which only one is correct. Choose the correct answer :

(a) Which one of the following is not a boiler mounting ?

(i) Superheater

(ii) Feed check valve

(iii) Blow off cock

(iv) Fusible plug

(b) Which of the following is an extensive property of a thermodynamic system ?

(i) Volume

(ii) Temperature

(iii) Pressure

(iv) Density

(c) Temperature at which condensation of vapour takes place, is called.

(i) Wet bulb temperature

(ii) Dry bulb temperature

(iii) Dew point temperature

(iv) Absolute humidity

(d) Lack of toughness in a material implies.

(i) Brittleness

(ii) Plasticity

(iii) Ductility

(iv) Softening

(e) The machine which can perform non-cutting forming process is

(i) Lathe

(ii) Milling machine

(iii) Shaper

(iv) Drilling machine

2. (a) State the function of following mountings :

(i) Water level indicator

(ii) Blow off cock

(b) Calculate the internal energy, enthalpy and entropy of 7 kg of steam at a pressure of 10 bar and dryness fraction of 0.8.

OR

(a) Define the followings.

(i) Latent heating/cooling

(ii) Critical point of water

(b) With the help of a neat sketch, describe the construction and working of a cochran boiler.

3. (a) Differentiate between intensive and extensive properties. Also give two examples of each.

(b) Compare two-stroke and four stroke engines.

OR

(a) Define the following terms as applied to I.C. engines :

(i) Brake power

(ii) Mechanical efficiency

(b) If a gas of volume 6000 cm^3 and at pressure of 100 kPa is compressed quasistatically according to $pV^2 = constant$ until the volume becomes 2000 cm^3, determine the work transfer.

4. (a) Define the following terms as applied to psychrometry :

(i) Dew point temperature

(ii) Absolute humidity

(b) Hot air at 150°C flows over a flat plate maintained at 50°C. The forced convection heat transfer coefficient is 75 W/m²-°C. Calculate the heat gain rate by the plate through an area of 2m².

OR

(a) Differentiate between natural convection and forced convection heat transfer ?

(b) Atmospheric air at 95 kPa, 30°C has a relative humidity of 70%. Determine humidity ratio.

5. (a) What are the main characteristics, which a good moulding sand should possess ?

(b) Give the composition, properties and uses of cast iron.

OR

(a) Define following mechanical properties of engineering materials.

(i) Elasticity

(ii) Hardness

(b) What do you understand by pattern allowances ? Discuss various pattern allowances in brief.

6. (a) How lathes are classified ?

(b) Give a comparison between A.C. and D.C. are welding.

OR

(a) What are three types of flames used in gas welding ? Also give their fields of applications.

(b) Explain in brief the various operations, which can be performed on a lathe machine.

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