BCS Scheme

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First Semester B.E. *Degree* Examination, Dec.2017/Jan.2018
Elements of Mechanical Engineering

Time: 3 hrs. **Max. Marks: 100**

Note: ***Answer FIVE full questions, choosing one full question from each module.***

Module-1

1 a. Write the differences between Renewable and Non-Renewable energy resources. **(06 Marks)**

b. Explain liquid flat plate-cplleCtor with neat sketch. **(06 Marks)**

c. Explain iiiiiiCiPle'OrNikleaf iioWei jildift With neat sketch. **(08 Marks)**

OR

2 a. Explain the formation of stearn.With T4-1 diagram. **(08 Marks)**

b. Explainthe construction and rfcifii'4.",aneashire Boiler". **(08 Marks)**

c. What are boiler. mountings..and acceSSOries?-,Liitexamples of each **(04 Marks)**

Module-2

3 a. DrA7*vahurtdrolwittrneut*etzlvand-PretsaTreAtelocity cliffgram; **(06 Marks)**

b. Explain the open cycle gas turbine With block diagram. **(06 Marks)**

c. The following observations were Inade during a trial run on a four stroke diesel engine:
Cylinder diameter = 25 cm
Stroke of the piston = 40 cm
'Crank shaft speed = 250 rpm.
Brake .load = 70 kg
Brake drum diameter - 2 m..
Mean effective pressure = 6, Bar
Diesel oil consumption =..0.1 litre/min
Specific gravity of diesel = 0.78
Calorific value of diesel = 43900 kJ/kg
Find : (i) Brake power (ii) Indicated power (iii) Friction power (iv) Mechanical efficiency (v) Brake thermal efficiency (vi) Indicated thermal efficiency. **(08 Marks)**

OR

4 a. Explain -construction and working of Four stroke SI engine with neat sketch and P-V diagram. **(08 Marks)**

b. Explain the working of Pelton wheel with neat sketch. **(08 Marks)**

c. Define : (i) Steam turbine (ii) Internal combustion engine. **(04 Marks)**

Module-3

5 a. Explain the taper turning by swivelling compound tool rest. **(06 Marks)**

b. List the various operations performed on drilling machine. Explain with the neat sketches Boring and counterboring operations. **(10 Marks)**

c. What is milling? Differentiate drilling and milling operation. **(04 Marks)**

Important Note

OR

a. Define automation and explain the flexible automation. **(06 Marks)**
b. Define Robot and write the classification of robot based on physical configuration. Explain the Cartesian co-ordinate robot with neat sketch. **(08 Marks)**
c. With the block diagram, explain the basic elements of NC automation system. **(06 Marks)**

Module-4

7 a. Write a note on ferrous alloys (any two). **(08 Marks)**
b. Define composite material. Mention its applications in aerospace and automation industries. **(06 Marks)**
c. Briefly explain types of non-ferrous alloys (any two). **(06 Marks)**

OR

8 a. ExPlain with neat sketch the are welding Method: **(08 Marks)**
b. List the different types of Oxy-acetylene flames and state their applications. **(06 Marks)**
c. -- Define : welding, brazing and soldering. **(06 Marks)**

Module-5.

9 Usti:tut the desirable_ pro perties,ofirkgpodxefrigerant **(06 Marks)**
b. Explain the principle and working of vapour compression refrigeration with neat sketch. **(08 Marks)**

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OR

10 a. Explain with a neat sketch, working of "room air conditioner. **(08 Marks)**
b. What are the differences between vapour compression and absorption systems? t,,08 **Marks)**
c. List out refrigerants commonly used in practice. **(04 Marks)**