KHAJA BANADANAWAZ UNIVERSITY

FACULTY OF ENGG. & TECH.

19KBBME24

BASIC MECHANICAL ENGINEERING

SECTION- A

Solve any TEN Questions: 2*10= 20 Marks

1. Define renewable and non- renewable energy sources
2. What are fossil fuels? Name any two fuels
3. Define nuclear fission and nuclear fusion.
4. Differentiate between ferrous and non ferrous metals.
5. Differentiate between metals and alloys
6. Define composite materials and list its types
7. Define Boyle's law
8. Differentiate between ideal and real gas.
9. Define Adiabatic and Isothermal process.
10. Define wet steam, dry steam, and superheated steam.
11. Define Firetube and watertube boiler,
12. What is Refreigeration?
13. Differentiate between impulse and reaction turbine.
14. Define internal combustion engine.
15. Define Automation and Robotics.

SECTION-B

Solve any FIVE Questions: 5*8= 40 marks

1. a) Distinguish between conventional and non conventional energy sources. 4
   b) write short notes on i) Flat plate collector ii) Solar Pond 4
2. a) Define engineering materials. What are the properties required for engineering materials. 4
   b) write the properties and field of application of Aluminium. 4
3. a) explain with sketch formation of steam. 4
   b) Find the enthalpy of 1 kg of steam at 12 bar when a) steam is dry saturated b) steam is 22 Percent wet c) superheated to 250 degree centigrade. Use steam tables. Assume sp, heat Of superheated steam is 2.25 KJ/KgK 4
4. a) what are the properties of a good refrigerant? 4
   b) explain the principle of air conditioning. 4
5. a) Draw a neat sketch of closed type gas turbine and explain its working. 4
   b) With the help of P-V diagram explain working of I.C.Engine. 4
6. a) explain the difference between open belt and cross belt. 4
   b) what are the advantages and limitations of gear drive, 4
7. a) Differentiate between arc welding and gas welding. 4
   b) What are the differences between soldering and brazing 4
8. a) With a neat sketch draw automation system showing various elements and explain its working. 4
   b) State and explain Asimov's laws of robotics. 4

SECTION C

Solve any FOUR Questions 10*4=40

1. a) Draw a layout of hydro electric power plant and explain its working. 5
   b) Draw a sketch of nuclear reactor and explain various components. 5
2. a) What are the advantages and limitations of coal based thermal power plants 5
   b) Draw a neat sketch of wind power plant and explain its working. 5.
3. a) Define the following terms with reference to thermodynamic processes
   i) Heat ii) work iii) Internal Energy iv) process v) cycle 5
   b) Establish relationship between sp. Heat at constant pressure [Cp] sp. Heat at constant volume [Cv] and gas constant R.
4. Draw a neat sketch of Babcock and Wilcox boiler showing different components and explain its Working in detail. 10
5. Draw a neat sketch of lathe machine showing the different components and explain the function Of each part. Also list the different operations that can be carried out on lathe. 10

6. a) Derive an expression for ratio of tensions in a belt drive. 5
   b) A flat belt open drive consists of pulleys of dia, 1000mm and 500 mm with the centre distance Of 1500 mm. The coefficient of friction between the pulley and belt is 0.3. When the max. tension In the belt is 700 N find the effective pull of the belt drive. 5
7. a) Classify the different robots based on configuration. 5
   b) List the advantages of CNC machines over conventional machines. 5

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