

August 2021

POWER PLANT INSTRUMENTATION*Time Allowed: 1 Hour**Full Marks: 35***Answer to Question No. 1 is compulsory and Answer any two questions from the rest.**

1. Answer the following questions (any ten): 2x10
- i) The commercial sources of energy are (a) solar, wind and biomass (b) fossil fuels, hydropower and nuclear energy (c) wood, animal wastes and agriculture wastes (d) none of the above
 - ii) Compounding of steam turbine is done for (a) reducing the work done (b) increasing the rotor speed (c) reducing the rotor speed (d) balancing the turbine
 - iii) The main source of production of biogas is (a) human waste (b) wet cow dung (c) wet livestock waste (d) all above
 - iv) Solar thermal power generation can be achieved by (a) using focusing collector or heliostates (b) using flat plate collectors (c) using a solar pond (d) any of the above system
 - v) In fuel cell, the _____ energy is converted into electrical energy. (a) mechanical (b) chemical (c) heat (d) sound
 - vi) The proper indication of incomplete combustion is (a) high CO content in flue gases at exit (b) high CO₂ content in flue gases at exit (c) high temperature of flue gases (d) the smoking exhaust from chimney
 - vii) A thermal power station requires space (a) equal to diesel power station (b) more than diesel power station (c) less than diesel power station (d) none of the above
 - viii) The modern steam turbines are (a) impulse turbines (b) reaction turbines (c) impulse-reaction turbines (d) none of the above
 - ix) In a steam power plant, the function of a condenser is (a) to maintain pressure below atmospheric to increase work output from the primemover (b) to receive large volumes of steam exhausted from steam prime mover (c) to condense large volumes of steam to water which may be used again in boiler (d) all of the above
 - x) Pipes carrying steam are generally made up of (a) steel (b) cast iron (c) copper (d) aluminium
 - xi) In coal preparation plant, magnetic separators are used to remove (a) dust (b) clinkers (c) iron particles (d) sand
 - xii) The artificial draught normally is designed to produce (a) less smoke (b) more draught (c) less chimney gas temperature (d) all of the above
 - xiii) What is nuclear 'reactor'?
 - xiv) Deaerative heating is done to (a) heat the water (b) heat the air in the water (c) remove dissolved gases in the water (d) none of the above
 - xv) Steam turbines are governed by the following methods (a) Throttle governing (b) Nozzle control governing (c) By-pass governing (d) all of the above

2. Write down differences between conventional and non-conventional sources of electrical energy. 7.5
 3. Describe a Wind power generation with the help of block diagram. 7.5
 4. Give a brief description of Nuclear power generation scheme. 7.5
 5. Discuss the four major circuits in steam power plant. 7.5
 6. Explain with PI diagram of boiler drum level control. 7.5
 7. What do you mean by super heater in thermal power plants? Explain in detail with neat sketches air fuel ratio control system used in power plants. 7.5
 8. Discuss about the lubricating oil temperature control. 7.5
 9. How the performance of turbine is monitored? Explain with PI diagram. 7.5
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