

December 2018

**POWER PLANT ENGINEERING***Time Allowed: 2 Hours**Full Marks: 35***Answer to Question No.1 is compulsory and to be answered first.****This answer is to be made in separate loose script(s) provided for the purpose.****Maximum time allowed is 30 minutes, after which the loose answer scripts will be collected and fresh answer scripts for answering the remaining part of the question will be provided.****On early submission of answer scripts of Question No.1,  
a student will get the remaining script earlier.****Answer any three questions from the rest.**

1. Choose the correct answer from the given alternatives (any eleven): 1x11
- i) Steam power plant works on:- (a) Rankine cycle, (b) Carnot cycle, (c) brayton cycle, (d) otto cycle.
  - ii) Superheating of steam is done at – (a) constant volume, (b) constant pressure, (c) constant temperature, (d) none of the above.
  - iii) The pressure at which the latent heat of vapourisation is zero is:- (a) atmospheric pressure, (b) 100 bar, (c) 221.2 bar, (d) 170 bar.
  - iv) In water tube boilers:- (a) the flue gas passes through the tubes and water flows outside, (b) water passes through the tubes and flue gas outside, (c) both water and flue gas passes through the tubes, (d) none of these.
  - v) Sub-critical boilers are those where working pressure is:-(a) more than critical pressure, (b) less than critical pressure, (c) equal to the critical pressure, (d) none of these.
  - vi) By using a condenser in a steam power plant:-(a) decreases the work done, (b) increases the work done, (c) has no effect on the work done, (d) none of these.
  - vii) In natural circulation boiler:-(a) circulation is assisted by a pump, (b) circulation is by density difference, (d) circulation is not done, (d) none of these. <https://www.wbscteonline.com>
  - viii) Economiser is provided to:-(a) to heat the primary air, (b) to heat the steam from boiler outlet, (c) to heat the feed water, (d) to cool the flue gas
  - ix) Air-preheater is installed to: -(a) to heat the air entering the furnace, (b) to heat the feed water, (c) to heat the flue gas, (d)none of these.
  - x) Coal mill is used to:-(a) to dry the coal and carry the coal to the furnace,(b) to crush the coal particles into powdered dust, (c) to wet the coal, (d) none of these.
  - xi) In coal handling system, the 'bunkers' are termed as:-(a)uncovered storage equipments, (b) covered storage equipments, (c) Transfer equipments, (d) none of these.
  - xii) The most popular conveyors used in coal handling systems are:-(a) Belt conveyor,(b) screw conveyor, (c) bucket elevator, (d) none of these.
  - xiii) The ESP is used to :- (a) arrest the dust from the flue gas, (b) cool the flue gas, (c) increase the velocity of the flue gas, (d) not used in power plant.

- xiv) Which of the following is used to cool the generator rotor:- (a) carbon dioxide, (b) oxygen, (c) hydrogen, (d) nitrogen.
- xv) The function of the moderator is to:- (a) cool the reactor, (b) to slow down the fast moving neutrons, (c) to reflect the neutrons, (d) all of the above.

2. a) What are the characteristic features of high pressure boilers?  
b) What factors are considered in selection of a thermal power plant? 4+4
3. a) What are the requirements of pulverised fuel burners.  
b) What are the various types of conveyors used in coal handling plant? 4+4
4. a) What is the function of ESP? Discuss in brief.  
b) Why boiler feed water should be treated before using it in boilers? 4+4
5. a) What is the function moderator and reflector in nuclear power plant?  
b) Discuss the working of CANDU type reactor. 3+5
6. a) Describe the functions of each components of a gas turbine power plant.  
b) What are the fuels used in gas turbine plants? 5+3
7. Write short notes on – (a) solar power plant, (b) wind power plant. 4x2
8. a) State the difference between natural circulation and forced circulation boiler?  
b) What do you mean by stoker fired boiler?  
c) What is front fired and tangential fired boiler? 3+2+3

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