



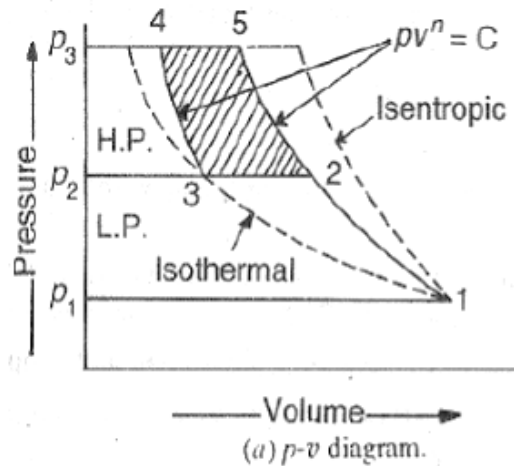
Important Instructions to examiners:

- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling errors should not be given more importance. (Not applicable for subject English and Communication Skills).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgment on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.

Corrected Model Answer

Marks

<i>Corrected Model Answer</i>	Marks
3. Attempt any <u>FOUR</u> of the following:	16
a) Explain the effect of perfect intercooling on two stage reciprocating air compressor with P.V. diagram.	4
Answer: (Note: P-V diagram- 03marks and effect of perfect intercooling- 01 mark) P.V. diagram of perfect intercooling of two stage reciprocating air compressor:	3
OR	



Effect of perfect intercooling:

Maximum temperature reached during the compression process is greatly reduced by intercooling. Therefore lubrication difficulties and explosion hazards are lessened. Total work done of compressor is increased. It reduces compression work of compressor.

1

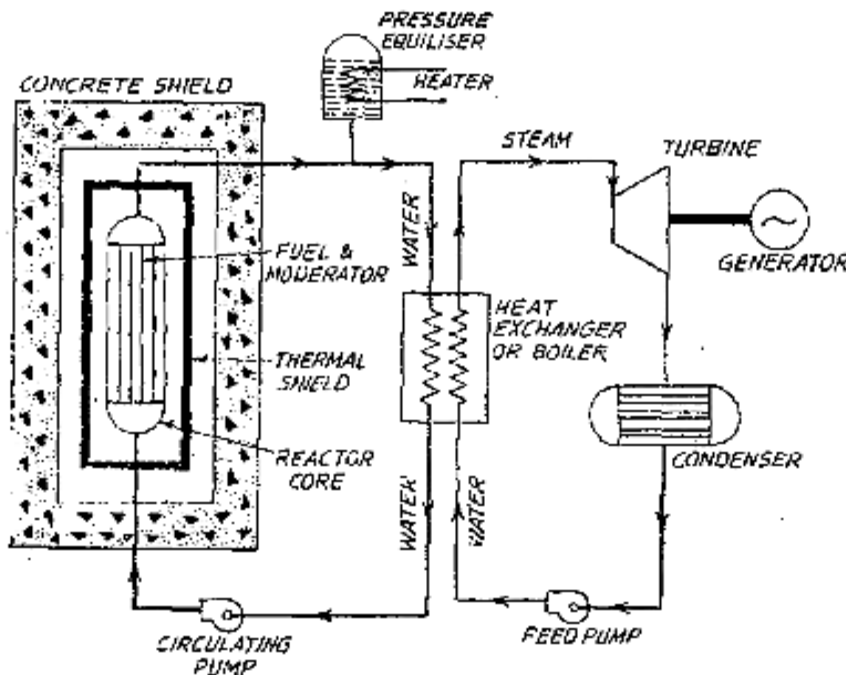
4. Attempt any TWO of the following:

16

a) Draw the label sketch of nuclear power plant with pressurized water reactor. Explain its working in brief. State the applications of it.

08

Answer: Nuclear power plant:



3

Fig. Nuclear power plant with pressurized water reactor



Working:-

A pressurized water reactor (PWR) nuclear power unit is a thermal power plant that is called "nuclear" because it uses the heat released by the fission of the nuclei of uranium atoms to produce steam.

In the primary system, the water is heated inside the reactor vessel in contact with the hot fuel assemblies that constitute the reactor core, then passes through thousands of tubes of steam generator, and driven by the reactor coolant pumps, returns to the reactor vessel. A pressurizer keeps the primary system under high pressure, to force the water to remain in the liquid phase and therefore ensure the most efficient heat transfer. Hence the name PWR for pressurized water reactor.

The water in the secondary system is heated by the primary system water outside the steam generators tubes and then is transformed into steam. A set of pipes carries this steam outside the reactor containment to the turbine, which is therefore set in motion, transforming part of the pressurized steam's heat energy to mechanical energy. At the turbine outlet, the steam is "sucked in" by the condenser, where it finishes cooling down sufficiently to be converted back into liquid water. This water is then carried back to the steam generators by the condensate extraction pumps, so the secondary system is a closed loop.

The turbine's mechanical energy drives the generator, which generates medium-voltage electrical energy.

Applications:-

1. Electric power generation.
2. Steam generation.

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01