

BOILER OPERATION ENGINEERS EXAMINATION, DEC-2013

BOILERS-I

Time: 2 1/2 Hrs

Marks: 100

- Note: 1) Candidates should attempt Six(6) questions subject to alternative or limitations, if any, mentioned herein or in each question. If more are answered, the last extra answers will be ignored.
- 2) Parts of the same questions must be answered together and must not be interposed by answer(s) to other question(s)
- 3) Question no. One is compulsory
- 4) Candidates should answer the paper in English only

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1. a) Which steam is good for process heating saturated or Super-Heated? And Why? 5
- b) What is super heater Starvation? What factors affect the Super heater design in boiler? 5
- c) Discuss briefly about Chattering and Hang-up of safety valve 5
- d) How do you find Tube Leakage in running boiler? 5
2. a) A safety valve is designed to blowoff at a gauge pressure of 0.8 N/mm^2 . The valve is held by a close coiled helical spring of mean coil diameter 180 mm and valve disc diameter is 80 mm. Find the diameter of spring rod if shear stress of rod is 75 N/mm^2 . 8
- b) A hollow shaft is to transmit 300 KW at 80 RPM. If shear stress is not to exceed 60 N/mm^2 and internal diameter is 0.6 of the external diameter find the external and internal diameter assuming the max. torque is 1.4 times the mean torque. 8
3. a) Discuss about Procedure for super heater safety valve pressure setting and drum safety valves pressure setting if the boiler approved working pressure is 105 kg/sq.cms and inlet pressure of steam turbine is 95 kg/sq.cms . 10
- b) What is stress relieving ? How it is useful in boiler maintenance? 6
4. a) What is boiling mechanism? What are the types of boiling? 6
- b) Discuss about Nucleate boiling in detail with a sketch? 10
5. a) What is attemperation and discuss about its purpose? 6