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ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF MECHANICAL AND PRODUCTION ENGINEERING

Semester Final Examination
Course No: ME 4805
Course Title: Power Plant Engineering

Summer Semester : A.Y. 2022-2023
Time : 3 Hours
Full Marks : 150

Answer all questions. The right column also indicates the course objective (CO) and Program outcome (PO) addressed by each question.

1. (a) With the help of schematic diagrams, discuss Gas Cooled Reactor (GCR) and Heavy-Water Reactor (HWR) power plants. 13
(CO1)
(PO1)

(b) Elaborate on the various parts of a nuclear reactor, draw diagrams when necessary. 12
(CO1)
(PO1)

2. (a) Discuss the importance of hydro-thermal mix for electricity generation. With neat diagrams, discuss the different types of hydroelectric power plants. 13
(CO1)
(PO1)

(b) With the help of a schematic diagram, briefly discuss the essential elements of a hydroelectric power plants. What are the biological and physical impacts created by the hydroelectric power plants? 12
(CO1)
(PO1)

3. (a) Write short notes on i) Air intake system, ii) Anti-icing system, iii) Evaporative cooling system, iv) Exhaust system and v) Starting system of Gas Turbine Power Plant. 10
(CO3)
(PO1)

(b) With the help of flow diagrams, briefly describe fuel gas and fuel oil system of gas turbine power plants. 8
(CO3)
(PO1)

(c) With the help of a flow diagram, briefly describe lubrication and power oil system of gas turbine power plants. 7
(CO3)
(PO1)

4. (a) Discuss with neat diagrams the change in pressure and velocity in impulse turbines and reaction turbines. 10
(CO3)
(PO1)

(b) Draw a schematic diagram and the corresponding T-s diagram of a Binary Vapor cycle. 8
(CO3)
(PO1)

(c) Briefly discuss different turbine losses in steam power plant. 7
(CO3)
(PO1)

5. (a) What are the factors that affect *pulverizer-grinding* performance along with its processing capacity? With a neat sketch, discuss the *bin system* for processing, distributing, and burning of *pulverized coal*. 10
(CO3)
(PO1)
- (b) Write down the *advantages of fluidized bed boiler* for burning solid fuels over the *stoker-fired* and *pulverized coal-fired* boilers. 8
(CO3)
(PO1)
- (c) With the help of a *neat sketch*, describe the *working principle* of a typical *CFBC boiler*. 7
(CO3)
(PO1)
6. (a) What is *Load Duration Curve* used in power plant *economics* and its application in *Industrial load* and *Residential Load*? Write down the importance of *load duration curve*. 10
(CO5)
(PO1)
- (b) Write short notes on (i) *Demand Factor*, (ii) *Load factor*, (iii) *Diversity factor*, (iv) *Plant capacity factor*, (v) *Plant Use factor* 8
(CO5)
(PO1)
- (c) Briefly discuss the different types of *loads* used in *power plant economics*. 7
(CO5)
(PO1)