BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – Dip.ME-2022/Dip.ME-2023
Course Name – Thermal Engineering-II
Course Code - DMEPC403
(Semester IV)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Choose the thermodynamic process for a closed-cycle gas turbine on which the air is compressed.
a) isothermally b) isentropically
c) polytropically d) none of the option

(ii) Identify the application of Reheating in a gas turbine.
a) increases the thermal efficiency b) increases the compressor work
c) increases the turbione work d) decreases the thermal efficiency

(iii) Select the maximum temperature in degree celcius of a gas turbine.
a) 200 b) 500
c) 700 d) 1000

(iv) The water tubes in a Babcock and Wilcox boiler are _____.
a) Horizontal b) Vertical
c) Inclined d) Horizontal and inclined

(v) Identify the boiler which has no drum.
a) Bension boiler b) cochran boiler
c) babcock & wilcox boiler d) lancashire boiler

(vi) Choose the natural circulation type boiler.
a) Bension boiler b) cochran boiler
c) babcock & wilcox boiler d) Both a & c

(vii) The flow through a nozzle is identified as _____.
a) constant volume flow b) constant pressure flow
c) isentropic flow d) isothermal flow

(viii) Select the critical pressure ratio of gases.
a) 0.528 b) 0.546
c) 0.577 d) 0.582

(ix) Select the shape of the turbine blade.

a) straight
b) circular
c) curved
d) none of the option

(x) Identify the maximum efficiency in impulse steam turbine.

a) 2Cosα
b) Cos2α
c) Cos(α/2)
d) Cos2α

(xi) Choose the reason for compounding in turbines.

a) reduce speed of rotor
b) improve efficiency
c) reduce exit losses
d) All of the option

(xii) The degree of reaction is identified as _____.

a) Heat drop in moving blades / total heat drop in the stage
b) Heat drop in fixed blades / total heat drop in the stage
c) Heat drop in moving blades / Heat drop in fixed blades
d) total heat drop in the stage / Heat drop in fixed blades

(xiii) Select the reason for High-pressure turbine becomes a Non-Condensing turbine.

a) exhaust conditions
b) axial flow of the steam
c) pressure-velocity compounding
d) velocity compounding

(xiv) Identify the geometrical structure of the turbine blades.

a) straight
b) circular
c) curved
d) All of the option

(xv) Select the Vapor quality of saturated steam .

a) 101
b) 51
c) 60
d) 0

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Define latent heat and sensible heat. (3)
3. Explain the term critical pressure ratio of a nozzle. (3)
4. Discuss the term Diagram Efficiency (3)
5. Explain the working principle of Ram jet engine. (3)
6. Explain the advantages of superheater using in a boiler. (3)

OR

Explain the Boiler selection factors (Any three). (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain the working principle of a Separating Calorimeter. (5)
8. Distinguish between Fire tube and Water tube boiler. (5)
9. Explain the working principle of a Babcock and wilcox Boiler with neat sketch. (5)
10. Write the differences between Gas turbine and steam turbine. (5)
11. Write a short note on Induced Draught system (5)
12. Distinguish between Impulse and Rection Turbine . (5)

OR

Explain the advantages of velocity compounding. (5)

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