BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – B.Tech.(EE)]-2021
Course Name – Thermal Power Engineering
Course Code - ES-ME401
(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) Identify Which of the following boiler is best suited to meet the fluctuating demand of steam

a) Locomotive boiler b) Lancashire boiler
c) Cornish boiler d) Babcock and wilcox boiler

(ii) select On what basis are fire and water tube boilers are classified?

a) Depending the combustion products formed b) Depending the state of fuel
c) Depending on the steam formation r d) Depending tubular heating surface

(iii) Choose The following volume of air is required for consuming 1 litre of fuel by a four stroke engine is?

a) 5-6m^3 b) 9-10m^3
c) 2.5m^3 d) 1m^3

(iv) Select what is the relation between Velocity Coefficient (C and Nozzle efficiency (ηn)?

a) Cc = (1/2) (ηn) b) Cc = √(ηn)
c) Cc = (ηn)2 d) Cc = (ηn)3

(v) Select Which of the following is the anti-knock for compression ignition engines?

a) amyl nitrate b) naphthene
c) hexadecane d) tetra ethyl lead

(vi) Steam turbine is classified on basis of _____

a) type of Steam flow b) type of blades
c) exhausting condition d) all of the mentioned

(vii) Identify the Thickness of the cylinder wall must be _____ in steam turbines.

a) decreasing b) constant
c) increased d) none of the mentioned

(viii) Classify The constant volume cycle is also called _____

a) Carnot cycle b) Joule cycle
c) Diesel cycle d) Otto cycle

(ix) Select For same compression ratio and for same heat added _____

a) Otto cycle is more efficient than Diesel Cycle.
b) Diesel cycle is more efficient than Otto Cycle.
c) Efficiency depends on other factors.
d) None of the mentioned.

(x) Choose the correct statement from the following.

a) Diesel cycle is more efficient than Otto cycle for a given compression ratio.
b) Otto cycle is more efficient than Diesel cycle for a given compression ratio.
c) For a given compression ratio, both Otto and Diesel cycles have same efficiency.
d) None of the mentioned.

(xi) Select the Otto cycle efficiency is higher than Diesel cycle efficiency for the same compression ratio and heat input because in Otto cycle _____

a) combustion is at constant volume.
b) expansion and compression are isentropic.
c) maximum temperature is higher.
d) heat rejection is lower.

(xii) Classify In a petrol engine, the mixture has the lowest pressure at the _____

a) beginning of suction stroke.
b) end of suction stroke.
c) end of compression stroke.
d) none of the mentioned.

(xiii) select Da-laval turbines are mostly used.....

a) Where low speeds are required
b) For small power purposes and and low speeds
c) For small power purposes and and high speeds
d) Foe large power purposes

(xiv) Identify In compression ignition engines, swirl denotes a _____

a) haphazard motion of the gases in the chamber.
b) rotary motion of the gases in the chamber.
c) radial motion of the gases in the chamber.
d) none of the mentioned.

(xv) Select The maximum efficiency of a Da-Lavel turbine is (where α= nozzle angle).....

a) Sin2α
b) Cos2α
c) Tan2α
d) Cot2α

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Define nozzle efficiency (3)
3. Explain is compounding of turbine (3)
4. State the different governing system used in steam turbine (3)
5. explain the factors involved in the selection of a boiler? (3)
6. Differentiate the gas turbine and steam turbine (3)

OR

Differentiate the open cycle gas turbine and closed cycle gas turbine. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Describe the working of cochran boiler with a neat sketch (5)
8. Describe the working of closed cycle gas turbine on p-v and T-s diagram. (5)
9. Calculate eficiency of Disel cycle (5)
10. In an Otto cycle, pressure ratio during compression is 11. Estimate the air standard cycle efficienct (5)
11. Write the P - v & T - s diagram for Otto cycle and Diesel cycle and Dual cycle for the same compression ratio and heat rejection, compare the efficiency. (5)

12. Explain the principle of operation of steam turbine (5)

OR

Explain the velocity diagram of an Impulse turbine. (5)

****