BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – Dip.ME-2022
Course Name – Thermal Engineering-1
Course Code - DMEPC304
(Semester III)

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) Tell that Photovoltaic cell converts solar energy into
a) Heat energy b) Electric energy
c) Mechanical energy d) Chemical energy

(ii) Identify the normal pressure at which the compressed air is stored?
a) 30 bar b) 40 bar
c) 10 bar d) 100 bar

(iii) Tell the availability of Renewable energy sources is _____
a) uncertain b) constant
c) high d) regular

(iv) Identify the use of Intake air filters?
a) To reduce the temperature of the air b) Used as storage and smoothened
c) To prevent dust from entering the compressor d) To remove the traces of moisture

(v) Recall which of the following statements is not true about Renewable Energy?
a) They do not cause pollution b) Their transportation is difficult
c) They cause ecological imbalance d) They have a low gestation period

(vi) Identify thecorrect cycle from the following that employs in vapour compression refrigerator.
a) Reversed Carnot b) Carnot
c) Reversed Rankine d) Rankine

(vii) Recall that most of the Renewable energy sources are _____
a) location-specific b) universally available
c) highly efficient d) polluting

(viii) In a vapour compression cycle, lowest temperature occur in _____.
a) Condenser b) Compressor
c) Expansion valve d) Evaporator

(ix) In a domestic vapor compression refrigerator, the refrigerant commonly used is _____.

a) CO_2 b) Ammonia
c) R-12 d) All of these

(x) The condition of refrigerant after passing through the expansion or throttle valve, in a vapor compression system is _____.

a) High pressure saturated liquid b) Very wet vapor
c) Wet vapour d) Dry vapour

(xi) Identify the correct option for under cooling in a refrigeration cycle.

a) Increases C.O.P b) Decreases C.O.P
c) C.O.P remains unaltered d) Other factors decide C.O.P

(xii) choose For the same compression ratio, the efficiency of dual combustion cycle is?

a) greater than otto cycle. b) less than diesel cycle.
c) less than otto cycle and greater than diesel cycle. d) greater than both otto and diesel cycle.

(xiii) 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.

(xiv) Choose For constant maximum pressure and heat input, the air standard efficiency of the gas power cycle is in the order.

a) Diesel cycle, Dual cycle, Otto cycle. b) Otto cycle, Diesel cycle, Dual cycle.
c) Dual cycle, Otto cycle, Diesel cycle. d) Diesel cycle, Otto cycle, Dual cycle.

(xv) Choose A two stroke engine gives _____ mechanical efficiency than a four stroke cycle engine.

a) higher. b) lower.
c) equal. d) none of the mentioned.

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Define bio fuels? (3)
3. Explain the Cut off ratio (3)
4. Discuss the properties of ideal refrigerant. (3)
5. Explain two-stroke engine? (3)
6. Explain detonation (3)

OR

Eplain term MPFI (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain the working principles of solar inverter. (5)
8. Define solar cell? (5)
9. Evaluate the mathematical expression of Morse Test (5)
10. Calculate efficiency of otto cycle (5)
11. Explain 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. Estimate the expression for mean effective pressure of an Otto cycle. (5)

OR

Distinguish Otto cycle and Diesel cycle? (5)