



C09-M-405

3505

BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2018
DME—FOURTH SEMESTER EXAMINATION
THERMAL ENGINEERING-II

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define the following terms :
 - (a) Indicated power
 - (b) Brake power
2. A four stroke engine has diameter 120mm and stroke 150mm . Indicated MEP on the piston is 6 bar and crank makes 1600 r.p.m find the indicated power of the engine.
3. Draw PV diagram for a single stage reciprocating compressor without clearance.
4. State any three advantages and disadvantages of gas turbine over IC engine.
5. State the function of a clutch in an automobile.
6. List out the factors to be considered for selection of a boiler.
7. State the function of the following :
 - (a) Fusible plug
 - (b) Super heater

8. Write any three applications of steam nozzles.
9. List the different methods of compounding in an impulse turbine.
10. What is the function of a governor.

PART-B

10×5=50

Instructions : (1) Answer *any five* questions.
(2) Each questions carries **ten** marks.
(3) Answers should be comprehensive and the criteria for valuation are the content but not the length of the answer.

11. The following results were obtained from a test on a petrol engine.

Indicated power = 30.3kW

Brake power = 26.05 kW

Fuel consumption = 8.205 kg/hr

Calorific value of fuel = 44.100 kJ/kg

Calculate : (a) indicated thermal efficiency

(b) Brake thermal efficiency

(c) Mechanical efficiency

12. (a) Explain the working pinciple of two stroke SI engine with line diagram.

(b) Explain the working principle of impulse turbine with the help of a sketch.

13. (a) Describe an axial flow compressor with a neat sketch.

(b) Estimate the manimum work required to compress 1kg of air from 1bar and 25⁰C to 16 bar in two stages. if the law of compression is $PV^{1.25} = \text{constant}$ and the inter-cooling is perfect.

14. Draw a neat sketch of constant volume gas turbine and explain its working principle. Represent the sequence of operations on PV diagram. *
15. What are the functions of the following elements in transmission system?
(a) Gear box, (b) differential, (c) Universal joint, (d) Propeller shaft, (e) Rear axle.
16. Draw a neat sketch of Babcock and Wilcox boiler and describe its working.
17. 1 kg/s of dry steam at a pressure of 8 bar enters a convergent divergent nozzle and leaves it at a pressure of 1 bar. If the flow is isentropic, and the corresponding expansion index is 1.135. Find the ratio of cross-sectional area at exit and throat for maximum discharge.
18. The nozzle of a De-laval turbine delivers one kg of steam per second at a speed of 800 m/s to a set of blades moving at 200 m/s. The nozzles are inclined at an angle of 16° to the plane of the wheel. The blade angle at outlet may be assumed as 25° and blade coefficient is 0.8 calculate
(a) Blade efficiency
(b) Power developed
(c) Energy lost in blades per second

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