

KADI SARVA VISHWAVIDHYALAYA

B. E. MECHANICAL ENGINEERING SEMESTER - I & II

Subject Code: CC104-N

Subject Name: Fundamental of Mechanical Engineering

DATE: 22/05/2024

TIME: 12:00 to 3:00

TOTAL MARKS: 70

Instructions:

- Answer each section in separate answer sheet.
- Use of scientific calculator is permitted.
- All questions are compulsory.
- Indicate clearly, the options you attempt along with its respective question number.
- Use the last page of main supplementary of rough work.

SECTION - I

Q-1 ALL COMPULSORY

- (A) Explain with neat sketch: open, close and isolated system. 05
- (B) Write down Difference between petrol and diesel engine. 05
- (C) Write down advantages and disadvantages of liquid fuels over solid fuels. 05

OR

- (C) Explain Adiabatic process. For adiabatic process find expression for work done and change in internal energy. 05

Q-2 ANSWER THE FOLLOWING QUESTIONS

- (A) Derive equation for air standard efficiency of Otto cycle. 05
- (B) Define and explain Zeroth law, First law and Second law of thermodynamics. 05

OR

- (A) Explain different forms of energy. 05
- (B) Explain working principle of steam turbines. 05

Q-3 ANSWER THE FOLLOWING QUESTIONS

- (A) Give detailed classification of IC engines. 05
- (B) Write down comparison between Carnot vapour and Rankine cycle. 05

OR

- (A) Explain with neat sketch Four stroke petrol engine. 05
- (B) The following readings were observed during a test on Two Stroke Single Cylinder Diesel engine: Bore = 22 cm, Stroke = 28 cm, Speed = 350 rpm, Net brake load = 65 kg, Effective brake drum diameter = 100 cm, Mean Effective Pressure = 3 bar, Fuel consumption = 4 kg/h, Calorific value of fuel = 43 MJ
- Calculate: (1) Indicated Power (2) Brake Power (3) Mechanical Efficiency

SECTION - II

Q-4 ALL COMPULSORY

- (A) Define air compressor. And write down the uses of compressed air. 05
- (B) Explain briefly why it is necessary to have speed control in prime movers? What is governor? What is the function of a governor on an engine? 05
- (C) Enlist basic components of a boiler. Also write down the function of grate box, Man hole and anti priming pipe. 05

OR

- (C) Write down a comparison between clutch and brake. 05

Q-5 ANSWER THE FOLLOWING QUESTIONS

- (A) Define rotary pump. Enlist types of rotary pump. Explain with neat sketch Gear pump. 05
- (B) Write short note on VCR refrigeration system. 05

OR

- (A) Write short note on window air conditioner. 05
- (B) What are bearings? How are they classified? Also write down the application of different bearings. 05

Q-6 ANSWER THE FOLLOWING QUESTIONS

- (A) Explain with a neat sketch of the internal expanding shoe brake 05
- (B) Write down comparison between boiler mountings and accessories. 05

OR

- (A) Write down comparison between ferrous and non ferrous metals. 05
- (B) Define and explain Welding, Soldering and Brazing. 05
