

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, Stoke = 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
