Code – M-1004

G. S. Mandal's

Maharashtra Institute of Technology, Aurangabad

(An Autonomous Institute)

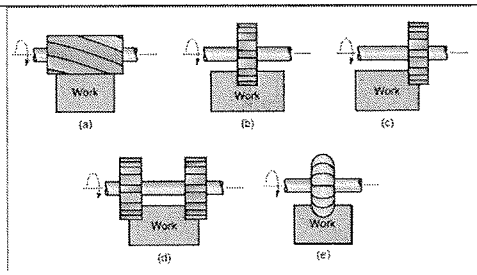
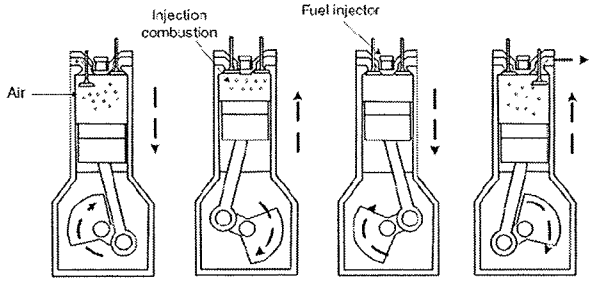
MAKE-UP EXAMINATION

First Year B.Tech (AE/ME/PPE) -April/May 2022

Course Code : ESC102 **Course Name : Basics of Mechanical Engg.**
Duration: 2 Hrs **Max. Marks : 50** **Date : 07/05/2022**

Instructions :
i) All questions are compulsory
ii) Assume suitable data wherever necessary and clearly state it
Figures to right indicate full marks

Q. 1	**Solve/Answer any five (Marks:10)**			
	Questions	Marks	CO	BL
a)	Define 'Isolated system'. Give example.	2	1	1
b)	State the working principle of the shaper machine.	2	1	1
c)	List any two permanent metal joining processes.	2	1	1
d)	State any two similarities between work & heat.	2	1	1
e)	State whether the steam stop valve is a mounting or an accessory of the boiler also Write the function of the steam stop valve.	2	1	1
f)	Enlist types of keys.	2	1	1
Q. 2	Classify and explain with neat sketches the types of belts according to the belt material used.	8	6	4
Q. 3	Choose the suitable type of engineering material for the following applications and justify the selection: - i) Refractories ii) Artificial human body parts iii) Packaging and bags iv) Transistors and intergraded circuits.	8	5	4
Q. 4	a) Explain fundamental laws of heat transfer.	4	2	4
	b) Explain the first law of thermodynamics applied to open and closed systems.	4	2	4
Q. 5	Identify and describe with neat sketches any four milling machining operations performed in the following diagram.	8	4	4

	 **(OR)**			
Q. 5	Identify and briefly describe the processes and arrange them in sequence. 	8	4	4
Q. 6	During the Viking mission landings on Mars, the atmospheric pressure was determined to be on average about 6.50 millibars (1 bar = 0.987 atm), and the actual average temperature measurement at the Viking landers' site was found to be -63 °C. Determine that pressure in torr, kPa, and temperature in K and F. **(OR)**	8	3	5
Q. 6	A system undergoes a cycle that comprises the four processes 1-2, 2-3, 3-4 and 4-1. The energy transfers are tabulated below. Determine the unknown kJ and complete the table.	8	3	5

Process	Q	W	ΔU
1-2	40	--	25
2-3	20	-10	--
3-4	-20	--	--
4-1	0	8	--