K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester: I/II
Class: FY	Program: B.Tech
Branch Code: FYE (MEC / CIV / CHEM)	Pattern: 2023
Name of Course: Fundamentals of Mechanical Engineering	Course Code: 2300114A
Max. Marks: 60	Duration: 2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains two pages.
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome of the Question/sub-question.

		Marks	CO
Question No. 1			
1a)	A gearbox input shaft rotates at 1000 rpm and input power delivered is 5 KW. The gearbox reduces speed by ratio 5:1. The overall efficiency is 85% find a) input torque b) output speed c) Output power d) Output torque	(6)	CO5
Question No. 2			
2a)	Estimate the loss of heat through a wall of cold chamber of length 5m, height 4m and thickness 0.25m. If the temperature of the wall surface are maintained at -10^{o}C and 30^{o}C respectively. Thermal conductivity of wall is 0.4 W/m-k. Also find heat flux.	(6)	CO3
Question No. 3			
3a)	Compare 4 stroke petrol (S.I) and 4 stroke diesel (C.I) engine	(8)	CO1
	OR		
3b)	Draw and explain following IC engine terminologies. i) Bore ii) Stroke iii) Swept Volume iv) Compression Ratio	(8)	CO1
3c)	Explain power transmission layout of IC engine vehicle , electric vehicle and hybrid vehicle	(8)	CO2
	OR		
3d)	State advantages and disadvantages of electric vehicle.	(8)	CO2
Question No. 4			
4a)	Explain following terms associated to sand casting process i) Mould ii) Core iii) Sprue and riser iv) Pattern	(8)	CO1
	OR		

4b)	Define forging and explain different types of forging method based on types of dies used.	(8)	CO1
4c)	Explain different methods of milling with the help of neat diagram.	(8)	CO1

OR

4d)	Compare soldering and Welding.	(8)	CO1

Question No. 5

5a)	Decode the following CNC Code N001 G90 M04 S1500 F0.2 N002 M06 T03 N003 M08 N004 G01 Z50 X-80	(8)	CO1

OR

5b)	Write short note on automatic retrieval system.	(8)	CO1
5c)	Define Flexible Manufacturing System (FMS). Illustrate the following FMS layouts with neat diagrams: i) In-line FMS ii) U-type FMS iii) Rotary FMS	(8)	CO1

OR

5d)	Write short note on CIM.	(8)	CO1

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