



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

	SUMMER-2023		
	Exam Seat No.:		
	Academic Year:2022-2023	Semester: II	
	Name of Programme: B.Tech	Pattern:2022	
	Name of Course: Fundamentals of Mechanical Engineering	Course Code: FYE221008	
	Max. Marks:60	Duration: 2.30 Hrs	

	<p>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.</p> <ol style="list-style-type: none">1. This question paper contains three page(s).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 and level of Blooms Taxonomy of the Question/sub-question	
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Question No. 1 Attempt following Question

- 1a) Spur gear pair is to be used to transmit power from an electric motor running at 1440 r.p.m. to a machine running at 360 rpm. Number of teeth on pinion is 18 while pitch circle diameter of pinion is 90 mm. Determine: (6) CO5
- i) Gear ratio ii) No. of teeth on the gear iii) Pitch circle diameter of the gear

Question No. 2 Attempt following Question

- 2a) Copper plate 0.045 m thick whose one face is maintained at 350°C and other face at 50°C . Thermal conductivity of copper is $370 \text{ W/m}^{\circ}\text{C}$. Find thermal resistance, heat flow rate and heat flux. (6) CO3

Question No. 3 Attempt following Question

- 3a) Draw general layout of four stroke engine and explain different parts and specify their materials. (6) CO1

OR

- 3b) Explain working of two stroke engine with neat and labelled diagram. (6) CO1

- 3c) Draw general layout of electrical vehicle and explain function of the different components. (6) CO2

OR

- 3d) What are the types of hybrid vehicle? Describe any one with neat and labelled layout. (6) CO2

- 3e) Define the following: (4) CO1

i) Bore ii) Stroke iii) Swept volume iv) Compression ratio

OR

- 3f) State the function of following engine components: (4) CO1

i) Cylinder head ii) Piston iii) Crank iv) Spark plug

Question No. 4 Attempt following Question

- 4a) Describe sand casting process with neat and labelled diagram. (6) CO1

OR

- 4b) Describe with neat sketch i) Open die forging ii) Closed die forging (6) CO1

- 4c) Explain following two operations with neat diagram. (6) CO1

i) Blanking ii) Piercing

OR

- 4d) Compare Welding, Soldering and Brazing. (6) CO1

- 4e) Write advantages and limitations of sand casting process. (4) CO1

OR

- 4f) Write short note on following two operations with neat diagram. (4) CO1
i) Taper Turning ii) Knurling

Question No. 5 Attempt following Question

- 5a) List types of automation and explain any one type of automation. (6) CO1

OR

- 5b) Explain working of CNC machine with the help of neat block diagram. (6) CO1

- 5c) Draw and explain general layout of flexible manufacturing system. (6) CO1

OR

- 5d) What is lean manufacturing? State 7 lean manufacturing tools. (6) CO1

- 5e) State advantages and limitations of CNC technology. (4) CO1

OR

- 5f) Write a short note on automated guided vehicles (AGVs). (4) CO1