R18 Regulation *Subject code:2E5CB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Supplementary Examinations, July 2024

ENGINEERING METROLOGY

(ME)

Maximum Marks: 70 Date:01.08.2024 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

	Part-A		
All the following questions carry equal marks (10X2M=20 Marks)		CO	Bloom Tx
1	Write the significance of metrology?	1	L1
2	List the objectives of metrology.	1	L1
3	Write the working principle of a dial caliper.	2	L1
4	Write a note on the types of micrometers.	2	L1
5	Why slip gauges are called 'Johansson gauges'?	3	L1
6	Define profile tolerance.	3	L1
7	Discuss the major applications of pneumatic gauges	4	L1
8	What are the limitations of pneumatic metrology?	4	L1
9	What are the primary reasons for surface irregularities?	5	L1
10	How does a semi-automated CMM differ from acomputer-controlled CMM?	5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)			
11	What are the possible sources of errors in measurements? Briefly explain them. [10M]	1	L2
	OR		
12	Define the following: (a) Range of measurement (b) Sensitivity (c) Consistency (d) Repeatability [10M]	1	L2
13	Explain the working principle of a dial caliper. [10M]	2	L2
	OR		
14	In a limit system, the following limits are specified for a hole and shaft assembly: [10M] $+0.02 \quad -0.02$ Hole = 30 +0.00 mm and shaft = 30 −0.05 mm Determine the (a) Tolerance and (b) allowance.	2	L2
15	Discuss the important applications of a tool maker's microscope. [10M]	3	L2
	OR		

16	The following limits are specified in a limit system, to give a clearance fit between a hole and a shaft: [10M] Hole = $25^{+0.03}_{-0.00}$ mm and shaft = $25^{-0.006}_{-0.020}$ mm Determine the following: a) Basic size b) Tolerances on shaft and hole c) Maximum and minimum clearances	3	L2
17	A metric screw thread is being inspected using the two-wire method in order to measure its effective diameter and the following data is generated: pitch = 1.5 mm, diameter of the bestsize wire = 0.866 mm, distance over the wires = 26.58 mm, and thread angle = 60°. Determine the effective diameter of the screw thread. Flanges of the micrometer on teeth flanks.' Justify this statement. [10M]	4	L2
	OR		
18	Discuss the major applications of CMMs. [10M]	4	L2
19	Explain how a gear caliper enables an accurate measurement of chordal thickness of a spur gear. [10M]	5	L2
	OR		
20	How is Taylor's principle applicable to thread gauging? [10M]	5	L2