

University of Mumbai
Examination May-June 2021 under cluster 9 (FAMT)

Examinations Commencing from 1st June 2021

Program **Mechanical** Engineering

Curriculum Scheme: **Rev2016**

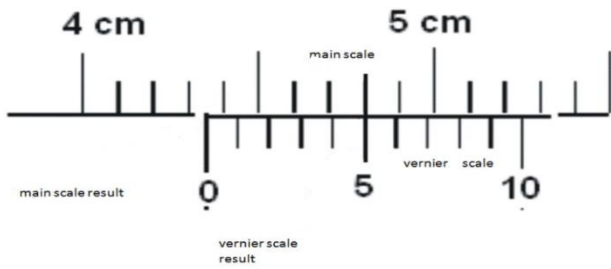
Examination: **TE Semester VI**

Course Code: **MEC601** and Course Name: **Metrology and Quality Engineering**

Time: 2-hour

Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which among the following is not an example of End Standard?
Option A:	Sine bar
Option B:	Vernier Caliper
Option C:	Micrometer
Option D:	Imperial Standard yard
2.	Which of the following components is not a case of Indirect Method of Measurement?
Option A:	Angle measurement by Sine bar
Option B:	Screw pitch diameter by Floating Carriage Micrometer
Option C:	Measuring diameter of shaft using Micrometer
Option D:	Density calculation by measuring mass and dimensions for calculating volume
3.	Use of Nanometrology
Option A:	to make nanomaterials
Option B:	to use nanotechnology
Option C:	to measure dimensions in nano scale
Option D:	to study nano materials
4.	Total Vernier Caliper reading given in Figure is  The diagram shows a Vernier Caliper with a main scale and a vernier scale. The main scale has markings from 4 cm to 5 cm. The vernier scale has markings from 0 to 10. The main scale result is 4.3 cm and the vernier scale result is 0.05 mm.
Option A:	4.35 mm
Option B:	4.3 mm
Option C:	4.35 cm
Option D:	4.3 cm
5.	Maximum Hole size is less than Minimum Shaft size it is
Option A:	Transition Fit

Option B:	Interference Fit
Option C:	Clearance Fit
Option D:	Loose fit
6.	While designing the, Go and NO-GO gauge, which allowance is provided only on GO gauge?
Option A:	Positive allowance
Option B:	Wear allowance
Option C:	Negative Allowance
Option D:	Special Allowance
7.	For inspecting the internal diameter of a bush, which type of gauge consume less time
Option A:	Double End Cylindrical Plug Gauge
Option B:	Progressive type Plug Gauge
Option C:	Snap Gauge
Option D:	Ring Gauge
8.	Pneumatic comparator work on a principal of
Option A:	Total Pressure
Option B:	High Pressure
Option C:	Low pressure
Option D:	Back Pressure
9.	Maximum shaft dimension less than Minimum hole dimension
Option A:	Interference Fit
Option B:	Clearance Fit
Option C:	Transition Fit
Option D:	Heavy hammer fit
10.	Arrange the sequence of method providing highest accuracy to low accuracy in measuring pitch diameter a) Best wire size method b) Two wire method c) Three wire method
Option A:	a-b-c
Option B:	c-a-b
Option C:	b-c-a
Option D:	b-a-c
11	The main use of a tool makers' microscope is in measuring
Option A:	Phase shift of monochromatic light
Option B:	Shape, size and angle of small machine component
Option C:	Biological degradation of small machine component
Option D:	Contours of small machine parts

12	Select the odd
Option A:	Bridge type CMM.
Option B:	Column type CMM.
Option C:	Row type CMM.
Option D:	Gantry type CMM
13	The distance between crest and root of the thread measured at right angle to the axis of thread is known as _____ of thread
Option A:	Number of starts
Option B:	form
Option C:	Depth of thread
Option D:	lead
14	In four sigma approach there should be
Option A:	less than 66807 defects per million opportunities
Option B:	less than 233 defects per million opportunities
Option C:	less than 6210 defects per million opportunities
Option D:	less than 3.4 defects per million opportunities...
15	_____ is the set of activities that ensures the quality levels of products and services are properly maintained and that supplier and customer quality issues are properly resolved.
Option A:	Quality Assurance
Option B:	Quality Planning
Option C:	Quality Control
Option D:	Quality Management
16	_____ are the charts that identify potential causes for particular quality problems.
Option A:	Control Chart
Option B:	Flow chart
Option C:	Cause and Effect Diagram
Option D:	Pareto chart
17.	Which of these would decrease the probability of making a Type II error?
Option A:	Increasing the sample size
Option B:	Reducing the fraction defective
Option C:	Increasing the AQL
Option D:	Reducing the LTPD
18.	Which of the following is used to represent the probability of accepting lots with various fractions defective?
Option A:	Sampling plan.
Option B:	OC curve.
Option C:	power test.
Option D:	indifference analysis.
19.	Which NDT test does not require skilled labour
Option A:	Dye penetrant testing
Option B:	Radiographic inspection

Option C:	Ultrasonic testing
Option D:	Magnetic particle test
20.	Which among the following is the last step in magnetic particle test method?
Option A:	Demagnetization
Option B:	Observation and inspection
Option C:	Magnetization
Option D:	Circular magnetization

Q2.	Solve any Two Questions out of Three										10 marks each					
A	Explain types of fits with neat sketches and suitable examples.															
B	Illustrate working principle of optical profile projector with its neat sketch and advantages															
C	In a manufacturing process the number of defectives found in the inspection of 15 lots of 400 items each are given below,															
	Lot No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	No. of defectives	02	05	03	04	00	06	08	07	04	03	05	10	12	07	09
	Determine, i. The trial control limits for 'np chart' and state whether the process is in control. ii. New value of mean fraction defective, if points outside control limits are eliminated. what will be the corresponding upper and lower control limit and examine whether the process is still in control or not.															

Q3.	
A	Solve any Two 5 marks each
i.	Explain the significance of Nanometrology
ii.	Distinguish between Single sampling and Double Sampling plans
iii.	Explain with neat labelled diagram Dye Penetrant testing and its applications
B	Solve any One 10 mark each
i.	Explain the construction and working of Johansson Mikrokator
ii	Illustrate working principle of any two types of CMM with its advantages