Total No. of Questions : 12]

SEAT No. :

P2394

[Total No. of Pages :3

[5153]-17
T. E. (Mechanical)
METEROLOGY & QUALITY CONTROL
(2008 Pattern) (Semester-II)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Use of logarithmic tables, slide rules and electronic pocket calculator is allowed.***
3) ***Neat diagram must be drawn wherever necessary.***
4) ***Figures to the right indicates full marks.***
5) ***Assume suitable data, if necessary.***

SECTION-I

Q1) a) Describe the following term : **[8]**
i) Errors occurs in measurement
ii)Accuracy and precision

b) Define striaghtness and flatness. Explain with neat sketch method of checking straightness of straight edge by wedge method. **[8]**

OR

Q2) a) Explain the following terms **[8]**
i) Sine bar and Give one example how to use sine bar
ii) Autocollimator

b) Explain any one Mechanical comparator with neat sketch. **[8]**

Q3) a) What is interferometer. Explain NPL Interferometer applied to flatness testing. **[8]**

b) What is Taylor's principle? Determine the dimensions and tolerances of shaft and hole having size of 25H8h7 fit. **[10]**
(IT7=16i, IT8=25i, D is in a step 18-30mm)

OR

Q4) a) Design a workshop gauge for GO and NOGO gauge suitable for 35H8. (IT8=25i, D is in a step 18-30mm) **[10]**

b) Write short notes on **[8]**
i) Tomlinson's surface meter
ii) Tool maker's microscope

P.T.O.

Q5) a) Derive the relation for width W and depth H by constant chord method. Calculate chord length and its distance below tooth tip for a gear of module 5 mm and pressure angle 20 degree. **[8]**

b) Derive an expression for best wire size for measuring effective diameter. Calculate diameter of best size of wire for M20X2.5 screw **[8]**

OR

Q6) a) Write short notes on **[16]**

i) Recent trends in meterology

ii) CMM

iii)Pitch errors in screw threads

iv)Universal measuring machine

SECTION-II

Q7) a) Difference between: **[8]**
i) Quality Cost and Quality value
ii) Quality of conformance and Quality of performance

b) Explain DR. Edward Deming's PDCA and PDSA cycle for quality control. **[8]**

OR

Q8) a) Explain the Pareto Analysis and Cause and Effect diagram **[8]**

b) Explain the concept of Juran's Trilogy approach. **[8]**

Q9) a) Explain the Quality circle and its structure and concept. **[8]**

b) Write short notes **[8]**
i) KANBAN
ii)Five 'S'

OR

Q10) Write short notes on **[16]**

a) KAIZEN
b) FMECA
c) SIX SIGMA
d) ZERO DEFFECT

Q11)a) Comparison between variable chart and attribute chart. **[8]**

b) Draw and explain OC curve. **[4]**

c) Calculate sample size and AOQ for single sampling plan using following data **[6]**

i) Probability of acceptance of 0.4% defective in a lot is 0.528
ii) Lot size = 10,000 units
iii)Acceptance number = 1
iv)nP' = 1.6
v) Defectives found in the sample are not to be replaced.

OR

Q12)a) Differentiate between single, double, multiple sampling plan. **[8]**

b) A component with specification limits 40±0.1 was inspected the components were taken sub group of 5 items 10 such sub groups were checked the X & R values were noted as follows

Subgroup	1	2	3	4	5	6	7	8	9	10
X(mean)	34	33.8	31.3	33.4	34.1	33.8	33.3	35	30.8	33.2
R	10	7	8	5	4	12	2	7	4	9

Establish the central limits for limits for X (mean) and R charts. Draw the chart & check whether the product will meet the specifications or not, (Take A_2 =0.577, D_3 =0, D_4 = 2.115) **[10]**

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