Department of Mechanical Engineering
INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, DESIGN AND MANUFACTURING, KANCHEEPURAM

Post: Junior Technician **Level 2** - Descriptive test **Total Marks:** 60 **Time:** 2 hours

(Please provide schematic or line diagrams while answering the questions)

	Part A (10 x 3 = 30) *(Answer any 10 questions from the following 12 questions of **Part A**)*
1	Explain 'Precision' and 'Accuracy' in manufacturing
2	Describe a single point cutting tool geometry by highlighting all angles.
3	What are different types of fire extinguishers and their codes?
4	What is '*surface finish*' of a part manufactured, and how is it measured?
5	Describe gas metal arc welding process.
6	Explain *first angle projection* and *third angle projection* in engineering drawing
7	Explain *up milling* and *down milling*
8	Draw the *stress-strain diagram* of (a) aluminum, and (b) concrete
9	Answer the following: (a) What is the difference between the *cutting speed* and *spindle speed*? (b) Evaluate the cutting speed if the shaft diameter is 60 mm, and the spindle speed is 500 rpm.
10	Describe the procedures for the following in MS-EXCEL software: (a) Create a formula to evaluate the AVERAGE of numbers in cells represented by *A1* till *A10* (b) What is the benefit of a FILTER? (c) How do you plot three different SERIES (or trend lines) on the same PLOT?
11	Describe the procedure for the following in MS-Powerpoint software (a) How do you set IITD&M *emblem* as a background with 50% opacity in a slide (b) What is the purpose of 'SLIDE ZOOM' (c) How to insert a hyperlink to a slide?
12	Describe the procedure for the following in MS-word software (a) What is the purpose of using BREAK under the LAYOUT heading in the main RIBBON of a page? (b) How to create a password protected MS-WORD file? (c) What is PDF file, and explain the way to convert MS-WORD file into PDF file.

Part B

(6 x 5 = 30)

*(Answer any 6 questions from the following 8 questions of **Part B**)*

1	Realize the dimension 58.975 mm using the following slip gauge set M112

Set M112		
Range (mm)	Steps (mm)	No. of blocks
1.001 – 1.009	0.001	9
1.01 – 1.49	0.01	49
0.5 – 24.5	0.5	49
25 – 100	25	4
1.0005	-	1

2	Explain the concept of least count of any measuring equipment *(e.g., vernier caliper, screw gauge, height gauge etc.,)* by highlighting the need for vernier scale
3	Present, in detail, the construction of a milling machine tool by explaining its various constituent modules
4	In a turning operation, two cutting tools are used. For the first cutting tool, the exponent is 3 and constant is 60 (while considering Taylor's tool life equation); similarly, for the second cutting tool, the exponent is 0.6 and constant is 90. Determine the cutting speed where both the cutting tools will have the same tool life.
5	Answer the following (a) Describe the procedure to create '*table of contents*' that can get updated in MS-WORD. (b) Explain the use of 'MASTER SLIDE' in MS-POWERPOINT. (c) What is the benefit of a pivot table in MS-EXCEL?
6	Answer the following in the context of designing jigs and fixtures: (a) Explain 'degrees of freedom' and its importance? (b) Explain the 3-2-1 principle.
7	Answer the following (a) Explain various methods of taper turning in a lathe (b) A shaft of length 900 mm is to be turned taper for a length of 225 mm. The amount of taper is 1:100. Determine the setover required?
8	What are the different types of conic sections, and how do you obtain them by cutting a cone using a flat plane?