

MANIPAL INSTITUTE OF TECHNOLOGY

A Constituent Institution of Manipal University

VII SEMESTER B.TECH. (PRINT AND MEDIA TECHNOLOGY) END SEMESTER MAKE-UP EXAMINATIONS, DEC/JAN 2016-17

SUBJECT: PRINT MAINTENANCE ENGINEERING [PME 429]

PROGRAM ELECTIVE IV

REVISED CREDIT SYSTEM (06/01/2017)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ANY FIVE FULL questions.
- ✤ Missing data may be suitable assumed.
- **1A.** The following production was collected from Komori offset four color printing machine's daily production report for five jobs. Using this information calculate the OEE of this printing machine.

Job Ticket No.	Total Production Time (min)	Regular Cleaning and maintenance time(min)	Make ready Time (min)	Down time (min)	Total Quantity Produced (No. s)	Total Quantity Defective (No. s)	Production rate (Impressions/ hour)
1223	600	30	120	80	46000	450	12000
1245	630	15	50	130	56000	100	14500
1235	1200	30	140	220	79500	300	13000
1236	540	20	100	100	36500	200	14000
1245	1350	15	210	310	102500	300	12000

- **1B.** List and explain the six major factors considered for the selection of bearings.
- **1C.** With a suitable diagram explain the condition monitoring test method used to detect internal flaws in a non-ferrous material. What are the advantages and disadvantages of it?

[04+03+03]

- 2A. Explain the significant features of following bearings
 - a) Self-aligning ball bearings c) Angular contact ball bearings
 - b) Needle bearings d) Oil less bearings
- **2B.** What the various offset dampening solution parameters to be maintained for quality printing? Explain the method, devices used and specification's for these parameters.
- **2C.** Explain the following lubricating devices with neat diagrams.
 - a) Single line resistance system b) Dual line system

[04+03+03]

- **3A.** What is a forced feed lubrication system? Explain its working, merits and demerits with a neat diagram.
- **3B.** Explain the following bearing failures.

a) Reverse loading

b) Lubricant failure

c) Corrosion failure

- **3C.** The annual consumption of 10 items in an engineering company are given below;
 - a) Classify items into A, B and C categories
 - **b)** Find percentage of items in each category
 - c) Calculate percentage of total value in each class

Sr.	Item	Price /	Annual
No	Description	Unit	consumption(Units)
1	Top shaft	30.00	200
2	Body casting	400.00	100
3	Hex nuts	0.20	2000
4	Bottom shaft	20.00	400
5	Spring washer	0.04	6000
6	o- ring	0.80	1200
7	Disc	100.00	100
8	Back up strip	0.70	2000
9	Pusher	1.00	1000
10	PTFE seal	400.00	80

[04 + 03 + 03]

- **4A.** With a neat diagram explain the working of a reversing motion pulley drive.
- **4B.** Differentiate between ultrasonic test and magnetic particle test used in condition monitoring maintenance.
- **4C.** Explain the working of a single stage double acting compressor system with a neat diagram.
- **4D.** Differentiate air-oil lubrication system from mist lubrication system with the help of neat diagrams.

[03 + 03 + 03 + 01]

- 5A. Explain the reasons and preventive actions for following types of gear failures.a) Abrasive wearb) Over load wear
- **5B.** With neat diagrams explain the following valves used in hydraulic systems.

a) Sequence valve b) Spool valve c) Pressure reducing valve

- **5C.** The ball bearings required in the manufacture of compressor at Jayanthi Engineering works limited, are procured from a local vendor. The company requires 750 sets of bearings per month. The procurement cost and the inventory carrying cost have been calculated at Rs. 48 per order and Rs. 0.60 per set per year respectively. Calculate economic order quantity and minimum total cost.
- **5D.** Explain the maintenance procedure for inking rollers in offset printing.

[03+03+03+01]

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- **6A.** With a neat diagram explain the working of a single stage single acting reciprocating compressor system.
- **6B.** The Bond Ex adhesive glue making company has four men available to work on four separate jobs. Only one man can work on any one job. The cost of assigning each man to each job is given in the following table. The objective is to assign men to jobs in such a way that the total cost of assignment is minimum.

Persons	JOBS						
	1	2	3	4			
Α	20	25	22	28			
В	15	18	23	17			
С	19	17	21	24			
D	25	23	24	24			

- **6C.** Explain the working of a hydraulic system with a neat diagram. What are the significance of its various elements?
- **6D.** Explain the importance of maintaining pH of dampening solution in offset printing.

[03 + 03 + 02 + 02]