

Seat No.	
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**B.E. (Mechanical) (Part - IV) (Semester - VIII) Examination,
2013**

INDUSTRIAL ENGINEERING

Sub. Code : 49418

Day and Date : Friday, 17 - 05 - 2013

Total Marks : 100

Time : 02.30 p.m. to 05.30 p.m.

- Instructions :
- 1) Attempt any three questions from each section.
 - 2) Figures to the right indicate full marks.
 - 3) Draw sketches wherever required.
 - 4) Assume suitable data, if required & mention clearly the same.

SECTION - I

- Q1)** a) Explain atleast five techniques of industrial engineering. [6]
 b) What are objectives of production control. [6]
 c) What is need of sales forecasting. [6]
- Q2)** a) How make or buy decision is taken. [6]
 b) Consumption of keys is 3000 per month Each key cost Rs. 5/- each. For placing order it costs Rs. 50/- and to stock keys costing is 5% of cost of key. Factory works for 300 days in year procurement time is 5 days and safety stock is 300 keys. [10]
 Find
 i) Economic order quantity.
 ii) Number of orders
 iii) Minimum and maximum stock
 iv) Reorder point.
 v) Total cost including material.
- Q3)** a) Describe inventory classification based on ABC. analysis and it's advantages. [8]
 b) From following time series data of sales, project sales for next two years. [8]

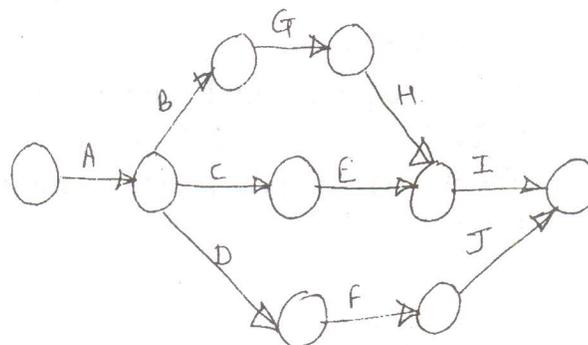
Year	2006	2007	2008	2009	2010	2011	2012
Sales Rs × (1000)	90	100	102	94	104	115	130

P.T.O.

Q4) a) Describe relation between production system, respective layout and material handling system. [8]

- b) Figure shows network of small project data for normal and crash time & cost is given below in table. If indirect cost in Rs. 50 /- per day, determine optimum project duration and cost. [8]

Activity	Normal		Crash	
	Time days	cost Rs.	Time days	cost Rs.
A	2	60	1	80
B	4	80	2	200
C	3	130	1	230
D	4	200	2	300
E	3	120	3	120
F	4	80	2	120
G	3	100	1	280
H	4	210	2	350
I	5	80	2	200
J	3	60	2	90



Network Diagram

SECTION - II

Q5) a) Compare productivity and efficiency and importance of productivity improvement. [9]

b) Define "Value". Explain with examples different types of values. [8]

Q6) a) Compare cycle graph and cronocycle graph their advantages and limitations. [8]

b) Explain multiple activity chart and it's application. [8]

- Q7) a) Why it is necessary to give allowances. What are different types of allowances. [8]
- b) The observed time and performance rating for 6 elements given below. Calculate standard time if personal & rest allowances 15% and contingency allowance 2% of basic time. Also find production for 8 hour shift. [8]

Element	Observed time (min)	Performance rating
① Position the job	0.5	82
② Switch on & lower drill	0.12	85
③ Drill hole	0.7	82
④ Raise drill & switch off	0.1	90
⑤ Remove job from jig	0.6	92
⑥ Inspect job	0.8	80

- Q8) a) Explain procedure of job evaluation. [8]
- b) Work sampling study shows total number of observations 4000 in which idle were 200 times. Performance rating is 90. Total number of part produced 1000 Allowances 15%. Study time duration was 5000 minutes Calculate [9]
- Standard time.
 - Estimate accuracy at 95% level of confidence.
 - If desired accuracy is $\pm 5\%$ comment on result.

