Total No. of Questions : 6]

P193

SEAT No. :

[Total No. of Pages : 2

BE/INSEM/APR-521

B.E. (Mechanical) (Semester - II) 402049B : INDUSTRIAL ENGINEERING (2015 Pattern) (Elective - III)

Time : 1 Hour]

Instructions to the condidates ;

[Max. Marks : 30

- 1) All questions are compulsory i.e. Solve Q.1 or Q.2, Q.3 or Q.4 and Q.5 or Q.6.
- 2) Assume suitable data, if necessary.
- 3) USe of electronic pocket calculator is allowed.
- 4) Neat diagrams must be drawn wherever necessary.

Q1) a) Discuss Fredrick W. Taylor's contribution to industrial engineering. [6]

- b) Define term productivity and name factors affecting productivity. [4] OR
- Q2) a) A factory can manufacture two products A and B by using either of two materials P or Q. Compare the productivity of material, labour and electrical energy in using materials P and Q. Product A is expected to sell at Rs. 30 per unit and Product B at Rs. 70 per unit. Also, comment on the relative advantage of using either of the materials. The operating data are as follows : [6]

	MaterialP	Material Q	, S
Output A	300 units	500 units	C.
Output B	200 units	100 units	X.O
Quantity of raw			
material usage	2000 kg	2000 kg	
Labour usage	350 man hrs.	300 man hrs.	
Electrical energy		0.0	
consumption	2000 KWh	1500 KWh	
Cost of raw material/kg	Rs. 30	Rs.50	
Labour per man hour	Rs. 7	• Rs. 7	
Electrical energy/KWh	Rs. 1 .8	Rs. 1 .8	

b) Explain productivity improvements methods for organisation.

P.T.O.

[4]

- **Q3**) a) Describe two-handed process chart with suitable example. **[6]**
 - What are therbligs? Give any four therbligs with symbols. [4] b)

- Differentiate between value analysis and value engineering. **Q4**) a)
 - Show and describe method study symbols for recording the facts. [4] b)

[6]

The observed time and the performance rating for the five elements are *Q*5) a) given below. Compute the standard time assuming rest and personal allowance as 15% and contingency allowance as 2% of the basic time.[6]

Element	A	В	С	D	E
Observed time (min)	2	0.8	5	1.2	1
Performance Rating	85	80	9050	85	80

- What is work sampling and where it can be useful in the area of **b**) production? [4]
- A work study was conducted in a machine shop. The data has been **06**) a) recorded. [6]

Total number of observations $\Rightarrow 2000$

Number of observations for no activity = 400

The ratio between manual to machine portion of the activities = 2:3

Average performance rating = 91%

Total number of pieces produced during study = 150

Duration of the study = 90 hrs.

Calculate the standard time/piece assuming 12% relaxation allowance.

Explain the effect of skill of the operator and pace of performance on b) standard time. [4]

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