College of Engineering, Pune-411005.
(An Autonomous Institute of Government of Maharashtra)
Department of Production Engineering and Workshop
END-SEMESTER EXAMINATION

Class : T. Y. B. Tech. Production S/W   Year : 2012– 2013
Subject : INDUSTRIAL ENGINEERING   Time : 3 Hours

Instructions:
1. Solve *any FIVE* questions.
2. Figures to the right indicate full marks.
3. Draw neat self-explanatory sketches wherever required.
4. Use of pocket calculators is allowed.
5. Assume suitable data if required.

Q.1 a) Define and differentiate between 'Management', 'Administration' and 'Departmentalization'. **3**

   b) Explain the Public/ State Enterprises type of ownership in details. **3**

   c) Explain 'Productivity measurement system'. **4**

Q.2 a) State motion economy principles related to 'Time conservation'. **3**

   b) Explain the 'Best practices' followed by an Industrial Engineer while conducting time study. **3**

   c) Explain 'salary and wage administration process'. **4**

Q.3 a) Explain the 'skill and effort rating' suggested by C.E. Bedaux. **3**

   b) Classify 'performance appraisal methods'. Explain 'Paired comparison method' of performance appraisal. **3**

   c) Construct the 'Travel Chart' for following activities performed by a messenger in an office having 5 workstations. Movements of messenger is as follows:

   1) Station 1 to Station 2 to Station 4 to Station 5, back to Station 1,

   2) Station 3 to Station 5 to Station 1 to Station 4, back to Station 3,   **4**

   3) Station 4 to Station 3 to Station 2 to Station 1, back to Station 4,

   4) Station 5 to Station 1 to Station 2 to Station 4, back to Station 5,

   Summarize the 'FROM' and 'INTO' movements.

Q.4 a) Define 'Performance appraisal process'. List its applications. **3**

   b) Explain 'Synthesis from standard data' and way of developing 'standard data' in time study. **3**

   c) Construct a 'S.I.M.O. Chart' for an operation of parting-off a thin plate into two pieces using a chisel and Hammer. (Assume suitable time/duration for each element/activity).

Chisel	Plate	Hammer

   4

Positions of chisel, hammer, plate and workman are shown in the layout.

Q.5 a) Define and differentiate 'Recruitment' and 'Selection' process. **3**

b) Explain the 'Man-Machine interaction' process in an ergonomic model. **3**

c) Work sampling study was conducted for 200 hours in the machine shop in order to estimate the standard time. The total numbers of observations recorded were 3000. No working activity could be noticed for 400 observations. The ratio between manual and machine elements was 2:1. **4** Average rating factor was estimated as 1.3 and the total numbers of articles produced during the study period were 6000. Rest and personal allowance is 10%. Estimate 'Standard Time'.

Q.6 a) State and explain different instructional methods followed in 'personnel training'. **3**

b) Draw and explain the workplace layout for a 'typical sub-assembly area' for a seated person with the considerations of Ergonomics. **3**

c) Using '50-50 Hasley Plan' and 'Rowan Plan' calculate wages of the operator for following data:

    1) Hourly wage rate= Rs.25/-

    2) Standard time to complete the job= 8 Hours. **4**

    3) Actual time taken to complete the job= 7 Hours.

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