Enrolment No. 17UPE094C

UPE05B12PE

B. Tech 5th Semester, Mid Term Examination-2019
Machining Principle & Technology (UPE05B12)

Time: 2 hrs. Full Marks: 50

Answer any five questions:-

1. (a) What is machining? Differentiate between machine tool and cutting tool.
   (b) Differentiate between orthogonal and oblique cutting. Why Cast Iron is used in Lathe bed material?
   (c) Discuss the function of face plate, driving plate and angle plate.
   (3+4+3)

2. (a) What is manufacturing system?
   (b) Explain job order production, Batch production and Mass production Systems.
   (c) How do you select the best manufacturing process? What is Kaizen concept? (2+5+3)

3. (a) How do you specify a Lathe? What is the function of steady rest and follower rest?
   (b) Explain the objective and characteristics of a good lay out of the plant.
   (c) What are characteristics of the special purpose machine tool?
   (5+3+2)

4. (a) What is function of idle gear in thread cutting? Calculate the suitable gear ratio for cutting the 8 mm pitch, double starts on a Lathe with a lead screw having 6.25 mm pitch.
   (b) Define:- Feed, Cutting Speed and depth of cut. What is function of rack-pinion mechanism?
   (c) A taper bar of length 100mm has a taper length of 60mm. The larger diameter of taper is 90mm and smaller diameter is 80mm. Determine the taper ratio and taper angle to which the compound rest should be set-up.
   (4+4+2)

5. (a) What is manufacturing time? A work-piece of 250mm dia. and 500mm length is to be turned down to 234mm for the entire length. The feed is 1.5mm and cutting speed 120m/sec. The max. allowable depth of cut is 1.3mm. Calculate, spindle speed, feed speed, MRR and machining time.
   (b) What is feed mechanism? Tool life testing a lathe under dry conditions the given value of "n" and "c" of Taylor's tool life equation as 0.12 and 130m/min. When coolant is used "c" increased by 10%. Find the increase the of tool life with the use of coolant at a cutting speed of 100m/sec.
   (5+5)

6. (a) What is automation? Explain the advantage of automation.
   (b) Discuss the basic feature of Capstan lathe.
   (c) Comparison in between Turret Lathe to Centre Lathe.
   (4+3+3)

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Enrolment No. U7UPE046

SA/PE05B14PE

B. Tech. 5th Semester Mid term Examination, 2019
Name of Subject: Design of Machine Elements
Paper code: **UPE05B14**

Time: 2 Hrs

Full Marks: 50

Answer Question 1 and any three from the rest.

20+3×10=50

1. A toggle jack is to be designed for lifting a load of 5 kN. When the jack is in the top position, the distance between the centre lines of nuts is 50 mm and in the bottom position this distance is 210 mm. The eight links of the jack are symmetrical and 110 mm long. The link pins in the base are set 25 mm apart. The links, screw and pins are made from mild steel for which the permissible stresses are 120 MPa in tension, compression and 60 MPa in shear. The bearing pressure on the nuts is limited to 20 N/mm2. Assume the pitch of the square threads as 6 mm and the coefficient of friction between threads as 0.20. **(20)**
2. With Flow Chart, explain the steps involved in design of machine elements. What is preferred numbers? What is factor of safety? **(8+1+1)**
3. What is maximum shear stress theory of failure? Explain the Rankine's theory of column failure. A hollow circular column of external diameter 250 mm and internal diameter 200 mm, carries a projecting bracket on which a load of 20 kN rests, as shown in Fig. 1. The center of the load from the center of the column is 500 mm. Find the stresses at the sides of the column. **(1+2+7)**

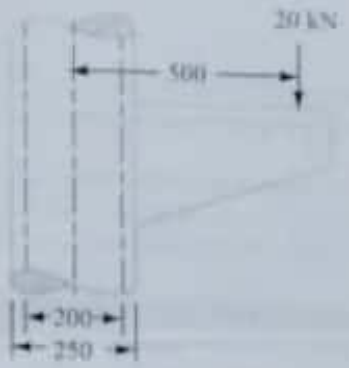

Fig 1

4. A shaft made of mild steel is required to transmit 100 kW at 300 r.p.m. The supported length of the shaft is 3 metres. It carries two pulleys each weighing 1500 N supported at a distance of 1 metre from the ends respectively. Assuming the safe value of shear stress is 60 MPa, determine the diameter of the shaft. **(10)**
5. Two mild steel rods are connected by a knuckle joint to transmit an axial force of 100 kN. Design the joint completely assuming the working stresses for both the pin and rod materials to be 100 MPa in tension, 65 MPa in shear and 150 MPa in crushing. **(10)**

Enrolment No. 1 9 3 7 5 0 4 6

S.UPE05B15.

B.TECH. 5th SEMESTER, MID TERM EXAMINATION 2019

NAME OF SUBJECT: **Materials Management**

CODE NO. : **UPE05B15**

Full Marks: 50 Time: 2 Hrs

The figures in the margin indicate full marks for the questions.
Answer all the questions.

1. Define materials management. Identify the basic types of inventory generally found in a manufacturing firm. (5)

2. Briefly explain the different elements of integrated materials management. (5)

3. What is ABC analysis? Write a short note on VED. (5)

4. Derive an expression for EOQ with instantaneous stock replenishment. (7)

5. ABC Corporation has got a demand for a particular part at 10000 units per year. The cost per unit is Rs.2 and it costs Rs.36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9 per cent of average inventory investment. Determine the following :
   (i) EOQ
   (ii) Optimum number of orders to be placed per annum.
   (iii) Minimum total cost of inventory per annum. (8)

6. Define purchasing. What are the different costs associated with inventory? (5)

7. State the basic objectives of material management. (5)

8. Discuss the essential criteria for vendor selection. (10)

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Enrolment No. 12HAPE0116

5,UPEO5B14PE

B.TECH,5th SEMESTER, MID TERM EXAMINATION
NAME OF SUBJECT: Ergonomic and Work system Design
CODE NO: - UPEO5B14

Time: 2 Hrs Full Marks: 50

Answer any Ten 5x10= 50

1. Define ergonomic? What is the objective of Human engineering? Explain why ergonomic is known as multidisciplinary. (1+2+2)
2. Explain the three aspect of Man-Machine system? (5)
3. Write short note on work place design Guidelines
(i) Design for psychosocial health and worker involvement
(ii) Design for the human body (2.5+2.5)
4. What are the types of Anthropometric data used in ergonomics? Sketch and explain the static anthropometric measurement commonly used in ergonomic. (5)
5. What are the three main tissue structures of the human locomotive system and what are their functions? (5)
6. How will you prevent from Work-related musculoskeletal disorders causes? Explain
7. What constitute excess work content? What the techniques are to reduce the work content (5)
8. What are the general ergonomic checklists for?
(a)Job analysis
(b)Work organization (2.5+2.5)
9. Explain the Risk of joint problems and injuries increase due to number of factors, and also draw the structure of two dimensional joint. (5)
10. Why study work? Explain the need and rationale for study of work. What is the scope of work study? (5)
11. Describe the structure of the musculo-skeletal system and shape (anatomy) and how they work and respond to loading (5)
12. Write a short note on
(i) Work study and the manager
(ii) Work study and the worker (2.5+2.5)

4. A) Discuss forecast errors. 5+5=10
B) A forecasting equation on annual demand by the method of least squares is as y=720+132x, where y is the forecast value, x is the years and 1992 is the base (origin) year. a) What is the annual demand for the year 1992? b) What would be the equation if 1995 is the base year? c) If the time scale x is changed to represent months, in the equation given, what would be the forecast for July 1992 and for May 1993?

5. A ready-made garments manufacturer has to process five items through 2 stages of production, viz. cutting and sewing. The time taken for each of these items at the different stages is given below (in hours): 10

ITEM	1	2	3	4	5
Cutting	5	7	3	4	6
Sewing	2	6	7	5	9

Find an order in which these items should be processed so as to minimize the total processing time. Also calculate the various idle times.

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Enrolment No. 1 7 0 P C 0 4 6

S5UPE05B16PE

B. Tech Odd-Semester Midterm Examination, 2019
COMPUTER AIDED DESIGN AND MANUFACTURING
UPE05B16

Full Marks: 50 Time: 2 hours

Answer all the questions. The figure in the margin indicate full marks for the question

1	Elaborate the various steps involved in a conventional designing process.	10
2	CAD workstation is the system interface with the outside world. What are the functions of this workstation?	5
3	With a neat sketch explain the functioning of a cathode ray tube display device used in a CAD/CAM system.	5
4	The output displayed on the display device, can be transferred in to a hard copy using Graphical Printers, Plotters and Photographic devices. Explain the various types of Graphical printers that are used to generate hard copies of the displayed content.	5
5	The graphics software is the collection program written to make it convenient for a user to operate the computer graphics system. What are the expected features of a graphics software?	5
6	Explain with an example how boolean operations can be used to construct a geometric model.	5
7	A line is to be drawn using slope method, where the starting point P_1 has coordinates (10,15) and end point P_2 has coordinates (20,25). Illustrate the steps to calculate the coordinates of all the intermediate points between the above mentioned end points. Show the x, y coordinates of all the points in a tabular form.	5
8a	A line is defined by $L = \begin{bmatrix} 1 & 1 \\ 2 & 4 \end{bmatrix}$ Translate this line by 2 units in X direction and 3 units in Y direction. What will be the new end points of the transformed line?	4
8b	Apply a scaling factor 2 to the above line. Show the scaling matrix and the end points of the new line	3
8c	Finally rotate the above line about the origin by 30°. Show the rotational matrix and the final coordinates after transformation	3

Enrolment No. 1 7 0 P E 0 4 6

Sub UPE05B15PE

B. Tech 5th Semester Mid Semester Examination, 2019

Name of Subject: Operation Planning and Control

Paper Code: UPE05B15

Full Marks: 50 **Time: 3 Hours**

The figures in the margin indicate full marks for the question

Answer any five questions. Answer sequentially

Candidates are required to give their own words as far as practicable way

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1. A) Forecast the sales for the 13, 14, 15 and 16th quarters for the data given in illustration below, using the least squares method. Also calculate the standard error of the estimate 5+5=10

Quarter	Sales	Quarter	Sales
1	600	7	2600
2	1550	8	2900
3	1500	9	3800
4	1500	10	4500
5	2400	11	4000
6	3100	12	4900

B) What are limitations of moving average method?

2. Here are the actual tabulated demands for an item for a nine month period (January through September). The supervisor wants to test forecasting methods to see which method was better over the period. 10

(a) Forecast April through September using a three month moving average.
(b) Use simple exponential smoothing with $\alpha = 0.3$ to estimate April through September.
(c) Use MAD to decide which method produced the better forecast over the six month period.

Month	Actual demand	Month	Actual demand
January	110	June	180
February	130	July	140
March	150	August	130
April	170	September	140
May	160		

3. The daily demand for girl typists at Girl Friday Business Services is noted from the past fifteen days records as shown in the table below. As a consultant forecaster, would you use a simple exponential smoothing with $\alpha = 0.1, 0.3$ or 0.5? How would the forecast compare with the actual? Do the forecasts lag behind in all the cases? If so why? 10

Day	Demand	Day	Demand
1	10	9	18
2	11	10	19
3	12	11	17
4	13	12	15
5	14	13	13
6	15	14	11
7	16	15	9