U.S.N ☐☐☐☐☐☐☐☐☐☐

P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Fifth Semester, B.E. - Mechanical Engineering
Semester End Examination; Dec - 2016/ Jan - 2017
Engineering Economics

Time: 3 hrs   Max. Marks: 100

Note: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.
      ii) Assume suitably missing data, if any.

UNIT - I

1 a.	Define wealth and explain classification of wealth.	10
b.	Define wants and explain classification of wants.	10
2 a.	Define supply, demand and equilibrium.	6
b.	Define wages and explain different types of wages.	8
c.	Explain the principles of taxation.	6

UNIT - II

3 a. Define effective interest rate.   2

b. Calculate effective interest rate, if nominal interest rate is 10.5% pa. If compounding is done,

   i) Half yearly   ii) Monthly.   4

c. A professor has 10 years of service before he retires. He now plans to deposit ` 1,00,000 at the end of the first year and there after an annual increase of `10,000 for the remaining years. If he can expect a return of 10%. Find the future sum on his retirement. If he survives for 10 years after retirement, how much can he withdraw every year?   14

4 a. State the condition for comparison of alternatives.   6

b. A company is evaluating three CNC machines of different makes for possible use in its facility, to purchase any one of them. If the technological life is 5 years at $i = 12\%$, which machine is preferable assuming all other factors are equal? Use net present worth evaluation.   14

Description	CNC - A (`)	CNC – B (`)	CNC – C (`)
First Cost	5,50,000	5,80,000	5,30,000
O & M cost	35,000/year	46,000/year	40,000/ year
Expected income	4,00,000/ year	4,40,000/ year	3,90,000/ year
Salvage	40,000	60,000	40,000

UNIT - III

5 a. Explain the causes of depreciation.   6

b. A machine costing `6,00,000 has an end value of ` 50,000 at the end of 20 years. Calculate;

   i) Depreciation in 15th year by diminishing balance method

   ii) Book value at the end of 10 years by sum of year digits methods   14

   iii) Depreciation in 12th year by sinking fund method, if the interest rate is 9% compounded annually.

6 a. Write a note on group replacement.   6

  b. An electric component consists of 10,000 resistors. When a resistor fails it is replaced at the cost
     of ` 1 Only. If all the resistors are replaced at the same time the cost/ resistors is ` 0.35. The
     probability of survival is given in the following table. Determine optimum replacement policy.   14
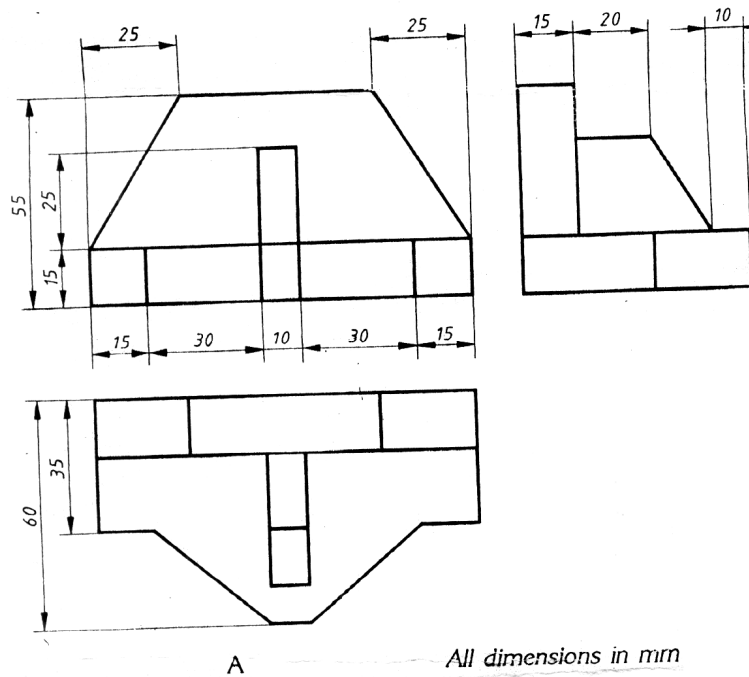
Month	1	2	3	4	5	6
Probability Survival	0.97	0.9	0.7	0.3	0.15	0

UNIT - IV

7 a. Define estimating. What is the function of an estimator?   8

  b. Estimate the weight of the component shown in figure, if the density of the material is 8 gms/cc.

A   All dimensions in mm

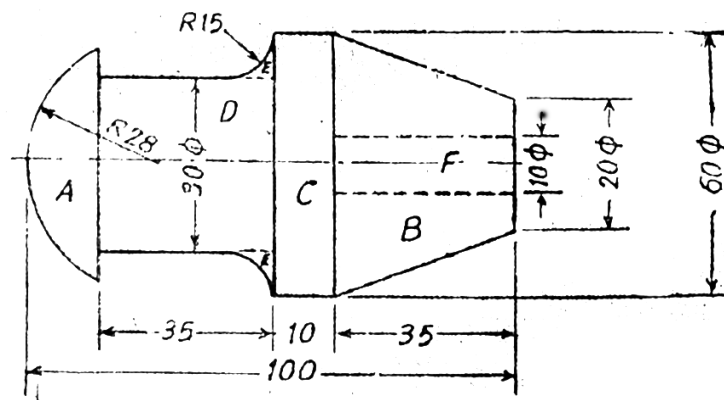   12

8 a. Differentiate between estimating and costing.   6

  b. Determine the weight of 100 articles of mild steel component shown in figure, if the density is
     7.8 g/cc.

All dimensions are in mm.

                                                                                                   14

UNIT - V

9 a. Explain different types of on-cost quoting a few examples. 12

b. The expenses of a manufacturing concern in shown in the following table;

Stock of material on 1st April 2015	` 20,000
Stock of material on 31st March 2016	` 22,000
Purchase of raw material in this period	` 52,000
Manufacturing wages	` 16,000
Work on cost	` 8,000
Administrative on cost	` 8,000
Sales during the year	` 90,200

8

Determine the profit and express in terms of selling cost.

10 a. Define:

i) Margin of safety ii) P/V ratio.

4

b. With the help of a graph, explain break even analysis. 6

c. A small company has the following details:

Sales Revenue	` 1,50,000
Fixed cost	` 25,000
Variable cost	` 50,000

Find the following:

i) Contribution

ii) Profit

iii) P/V ratio

iv) BEP

v) Margin of safety

10

✳ ✳ ✳