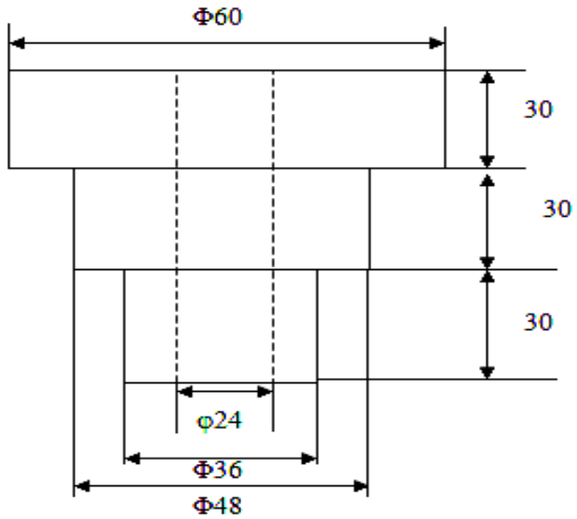
Q.6 Attempt any two:

i. Write the formula for finding the volume of **5**
(a) Cylinder, (b) Frustum of cone and (c) Segment of sphere.

ii. Find the cost of 2000 C I pulleys as shown in the fig. Its surfaces are to be machined after casting. The pattern is supplied by the customer. Following data is to be used. Cost of metal = Rs 20/kg, Moulds prepared by each worker = 20, Melting charges = 20% of metal cost. Machining allowance on each side = 2 mm. Wages of each moulder = Rs 160 / day. Density of cast iron = 7.2 gm/cc. Overhead charges = 25% of metal cost. **5**



iii. Describe the following methods: **5**
(a) The Average ordinate rule
(b) The trapezoidal rule

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Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2018

OE00007 Mechanical Estimation & Costing

Programme: B.Tech. Branch/Specialisation: All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Main factors to be considered while prepare the detailed estimate is **1**
(a) Quantity of material (b) Availability of material
(c) Transportation of material (d) All of these

ii. Qualification of estimator is: **1**
(a) Should be an engineer
(b) Understanding of manufacturing process
(c) Knowledge of sketch and drawing
(d) All of these

iii. Which of the following is Direct material for machine shop? **1**
(a) High speed steel (b) Coolant
(c) Cotton (d) All of these

iv. Which of the following is considered as indirect expenses for a factory? **1**
(a) Stationary (b) Cleaner (c) Crane driver (d) All of these

v. Which operation cannot be performed on manual milling machine? **1**
(a) Side cutting (b) Profiling (c) Slot cutting (d) Turning

vi. Welding operation does not include **1**
(a) Machining cost (b) Power cost
(c) Electrode cost (d) All of these

vii. A product becomes obsolete when there is: **1**
(a) Similar product at low cost
(b) New product at latest technology
(c) Stops proper functioning
(d) All of these

viii. Calculation of depreciation rate is important because of: **1**
(a) Replacement of assets (b) Tax benefits
(c) Avoid run out of business (d) All of these

ix. Mensuration is important for calculating **1**
(a) Area and volume
(b) Quantity of material required
(c) Material cost
(d) All of these

x. Area of irregular figures can be calculated by: **1**
(a) The average ordinate rule (b) The trapezoidal rule
(c) The Simpson's rule (d) All of these

Q.2 i. List any five objectives of estimation. **2**

ii. What are the various elements to be considered while estimating the cost of a product? **3**

iii. Explain the sources of error in estimation. Also describe qualities and function of an estimator. **5**

OR iv. Define standard cost. Differentiate between estimation and costing. Show the advantages of efficient costing **5**

Q.3 i. Draw the block diagram of components of cost. **2**

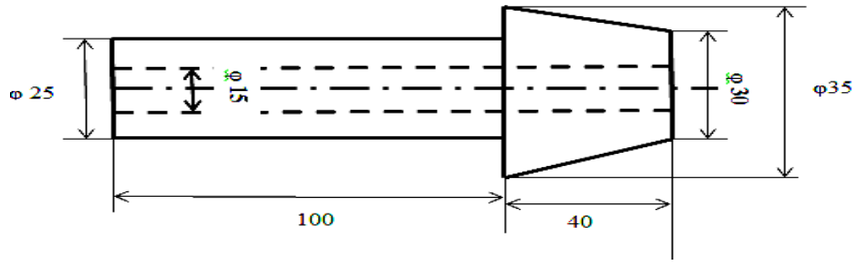
ii. Explain various methods of allocation of overhead cost in the organisation. **3**

iii. The market price of a machine is Rs. 60,000 and the distributor is allowed a discount of 20% of the market price. It is found that the selling expenses are 50% of factory cost. The material cost, labour cost and factory overheads are in the ratio of 1: 3: 2. If the labour cost is R 12,000, determine the profit on each machine. Neglect other overheads. **5**

OR iv. Describe the following with example: Marginal Cost, out of pocket Cost, Sunk cost, Differential cost, variable cost. **5**

Q.4 i. Define cutting speed and feed related to lathe. List at least six operations performed in machine shop. **4**

ii. A product shown in figure below is to be turned from 35 mm diameter and 150 mm long MS bar stock. Calculate the machining time required if depth of cut is not to exceed 5 mm and cutting speed is 20 m/min. Feed is 1 mm/rev. for drilling and facing. Feed for turning is 2 mm/rev **6**



OR iii Estimate the cost of weld from the following data: Thickness of plate =10 mm; Electrode diameter = 6 mm; Minimum arc voltage =30 volts; Current used = 250 Amperes; Welding speed = 10 m/hour; Electrode used/meter of weld= 0.350 Kg; Labour rate= Rs. 40/hr; Power rate = Rs. 3/Kwh; Electrode rate = Rs. 8/Kg; Efficiency of welding m/c= 50%; Connecting ratio= 0.4; Overhead charges= 80% of direct charges; Labour accomplishment factor =60%. **6**

Q.5 i. Explain Obsolescence. Explain the sinking fund method for calculating the depreciation **4**

ii. The automatic screw cutting machine has been purchased for Rs. 60,000. In the start of second year a motor is fitted into the machine costing Rs. 2000. Its scrap value at the end of 10 years is estimated as Rs. 12,000. Calculate the following by reducing balance method: **6**
(a) Depreciation rate (b) Depreciation in first two years and last two years

OR iii. A car was purchased for Rs 96,000. Its estimated life period is ten years. The residual value of the car after its useful life is Rs 24,000. Rs. 5000 added in for name transfer. **6**
(a) Calculate the depreciation rate for first two year using sum of digit year.
(b) Calculate the depreciation fund at the end of two years.

Marking Scheme

OE00007 Mechanical Estimation & Costing

Q.1	i.	Main factors to be considered while prepare the detailed estimate is d) All of the above		**1**
	ii.	Qualification of estimator is: d) All of the above		**1**
	iii.	Which of the following is Direct material for machine shop? a) High speed steel		**1**
	iv.	Which of the following is considered as indirect expenses for a factory? (d) All of these		**1**
	v.	Which operation cannot be performed on manual milling machine? (d) Turning		**1**
	vi.	Welding operation does not include a) Machining cost		**1**
	vii.	A product cannot becomes obsolete when there is: (d) All of these		**1**
	viii.	Calculation of depreciation rate is important because of: (d) All of these		**1**
	ix.	Mensuration is important for calculating (d) All of these		**1**
	x.	Area of irregular figures can be calculated by: (d) All of these		**1**
Q.2	i.	Any five objectives of estimation. Five objectives		**2**
	ii.	Elements to be considered while estimating the cost of a product? Each element 1 mark	(1 mark * 3)	**3**
	iii.	Source of error Qualities and function of estimator	3 marks 2 marks.	**5**
OR	iv.	Standard cost Difference between estimation and costing Advantages of efficient costing	2 marks 2 marks 1 mark.	**5**
Q.3	i.	Block diagram of components of cost.		**2**
	ii.	Any Three methods of allocation of overhead cost in the organisation 1 mark for each	(1 mark * 3)	**3**
	iii.	Material cost Overhead Profit	1 mark 2 marks 2 marks.	**5**
OR	iv.	Describe the following with example: Marginal Cost, out of pocket Cost, Sunk cost, Differential cost, variable cost. 1 mark for each cost	(1 mark * 5)	**5**
Q.4	i.	Cutting speed Feed Six operation in machine shop	1 mark 1 mark 2 marks.	**4**
	ii.	Machining time for turning Machining time for facing Machining time for drilling	3 marks 1 mark 2 marks.	**6**
OR	iii	Cost of power Labour cost Material cost	2 marks 2 marks 2 marks.	
Q.5	i.	Explain Obsolescence. Explain the sinking fund method for calculating the depreciation Obsolescence Sinking fund formula	2 marks 2 marks.	**4**
	ii.	(a) Depreciation rate (b) Depreciation in first two years and last two years	2 marks 4 marks.	**6**
OR	iii.	(a) Calculate the depreciation rate for first two year using sum of digit year (b) Calculate the depreciation fund at the end of two years	2 marks. 4 marks.	**6**
Q.6		Attempt any two:		
	i.	Volume of cylinder Frustum of cone Segment of sphere	1 mark 2 marks 2 marks	**5**
	ii.	Material cost Labour cost Final cost	2 marks 2 marks 1 mark	**5**
	iii.	Describe any two of the following methods: (a) The Average ordinate rule (b) The trapezoidal rule	 2.5 marks 2.5 marks	**5**

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