MODEL ANSWER

WINTER– 17 EXAMINATION

Subject Title: Estimation and Costing Subject Code: 17557

Important Instructions to examiners:

1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
3) The language errors such as grammatical, spelling errors should not be given more importance. (Not applicable for subject English and Communication Skills)
4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
6) In case of some questions credit may be given by judgment on part of examiner of relevant answer based on candidate's understanding.
7) For programming language papers, credit may be given to any other program based on equivalent concept.

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Q. No.	MODEL ANSWER	Marks
1)	**Attempt any Five**	**5 X 4=20**
a)	**Depreciation:** Efficiency and value of machine or asset reduces with the laps of time during use,which is known as Depreciation. It's Causes: 1) Depreciation due to wear and tear 2) Depriciation due to physical decay. 3) Accidential depreciation. 4) Depreciation due to deferred maintenance and neglect. 5) Inadequacy. 6) Depreciation by obsolescence	**2 Marks** **2 Marks**
b)	**Forging operation:** The shape of material can be transformed by forging with the aid of the following operations: **1. Drawing Down**- It is also known as Drawing Out. This operation is performed to increase the length of the workpiece in forging by decreasing the cross-sectional area.This process is performed by hammering the hot workpiece lengthwise to reduce cross-section. **2. Up Setting**- This is the reverse of Drawing Down operation.In this operation, the cross-section of the workpiece is increased at the expense oflength. This process is performed by hammering one end of hot workpiece while other end is supported against the anvil. **3. Bending-** Bending is done by holding the workpiece between two fixtures and desired bend can be given by striking the workpiece with the help'of hammer, This operation can also be carried out on the anvil beak. **4. Punching and Drafting**- Punching operation is perfcrmed by a tool called punch, for producing holes in the workpiece, when it is in the hot state ; and drafting is an operation carried on by a special tool known as draft to enlarge the hole.	**4 Marks**
c)	**Functions of Estimator:** **1.** To prepare estimate on the request from sales department or from production department or from "Cost Estimating and Cost Accounting department. **2.** To consult production department, purchase department and other connected departments, like Time study department, and Planning department for collecting latest informations related to various aspects necessary for preparation of correct estimates.	**4 Marks** **(Any 4 points)**

	3. To consult the reference files of his own section for finding cost of materials needed , time for production and overheads, etc. **4.** To collect the informations, related to engineering design and specification of the product, manufacturing methods or procedures, tools and equipment required, and materila handling. **5.** To collect informations and use them for preparation of estimates related to tool, equipment and pattern cost, transportation costs, profits etc.	
d)	**AVERAGE PRICE METHOD:** In this method avg. cost of the material is charged for the product. The two methods commonly used are; i) Simple average method – It means the avg. cost of material in hand on the date of issue from stores. Each time, when the material is issued, avg. cost is calculated. Therefore, new calculations are necessary after every entry to obtain the mean price. ii) Month end average method – In this method avg. cost of each type of material is calculated at the end of each month and is charged for all the issues during the following months.	**4 Marks**
e)	**Types of Overheads** -Factory Overheads -Administrative Overheads -Selling Overheads -Distributing Overheads -Fixed Overheads -Floating Overheads **Factory Overheads:** These are composed of items wholly chargeable to the actual operation of the factory such as indirect labour, indirect material etc. It is also known as works-on-cost'. **Administrative Overheads:** These include salaries of general office staff and high rank officers; telegraph and telephone charges; depreciation of office equipment etc. This is also known as 'establishment on-cost'. **Selling Overheads:** These include salaries of persons working in sales department, advertising expenses and agency expenses etc. **Distributing Overheads:** These include expenses made on holding finished stock, despatching them to the customer, packing cost etc. **Fixed Overheads:** These are those indirect expenses which remain constant regardless the	**2 Marks** **2 Marks for any one explanation**

	volume of production such as salaries of higher officers, rent of building and insurance charges etc. These are also known as 'constant expenses'. **Floating Overheads:** These are those indirect expenses which vary with the volume of production such as power, fuel, stores, supplies etc. These are also known as 'variable or fluctuating expenses'.	
f)	**Capacity of Power Press:** For capacity calculation purposes power presses can be divided into two categories : (*i*) the shaft of which is driven (by gearing or by belt) from one end ; (*ii*) the shaft of which is driven from both the ends. For calculation of capacity of these presses following empirical relations are generally used : (*i*) When shaft is driven from both end : Maximum pressure available, in tonnes = $0.5\ D^2$ where, D is the crank pin dia in cm, (*ii*) When shaft is driven from one ends : Maximum pressure available, in tonnes = $0.75\ D^2$ As, Shearing force required = Area to be sheared × Shearing stress. Hence, while procuring power press its crank pin dia must be decided and can be calculated by knowing the maximum shearing force required and using the above relations and putting the proper shearing stres of the material required to be used. Therefore, shearing stress for some of the important metals given hereunder : Aluminium = 0.72 tonne/cm^2 Mild Steel = 3.1 tonnes/cm^2 Alloy Steel = 5.7 tonnes/cm^2 Tin = 0.3 tonnes/cm^2	**4 Marks**
g)	**Procedure of job order costing:** Job order costing or job costing is a system for assigning manufacturing costs to an individual product or batches of products. Generally, the job order costing system is used only when the products manufactured are sufficiently different from each other. In a job-order costing system, jobs are accounted for using the job-order cost sheet. The process involves the following steps: 1) Identification of the job	**4 Marks**

	2) Tracing direct costs to the job 3) Identifying the indirect costs i.e. manufacturing overheads and finding the cost allocation base for each cost. 4) Applying the indirect costs to the job using the pre-determined allocation rate. 5) Finding total cost by summing up all the cost components. 6) Closing the under/over-applied manufacturing overheads to cost of goods sold/income statement. 7) Calculating revenue and profit.	
2)	**Attempt Any Two**	**2 X 8= 16**
a)	**Qualities of Estimator** An estimator must possess following essential qualities : (i) He must be able to read and understand drawings and blue prints well. (ii) He must have good knowledge of different machines, their operations and operation timings for the products being manufactured. (iii) He should have a goodknowledge for the use ofproper tools, jigs and fixtures etc. (iv) He must have good knowledge of market prices of different materials required in the manufacture. (v) He must have good knowledge about the wage rates of all types of workers. (vi) He should have good knowledge about different allowances for time, i.e. personal allowance, fatigue allowance, tool changing allowance, grinding allowance and checking allowance etc. (vii) He must have good knowledge about the cutting speeds,feeds and depth of cuts for different materials, operations and different types oftools. (viii) He must be a well qualified and trained technical person and must be able to suggest new methods of production to reduce the production cost. (ix) He must know the official account classification. (x) He must know the procedure for conducting "Time and Motion Study". (xi) He should also have good knowledge about the business matters. (xii) He must co-operate with other departments, specially with production,design,planning and sales departments.	**8 Marks for any 8 points**

b)	Numerical: Volume of head $\frac{\pi}{6}h^2(3D-2h)$ h= 20mm D=2*28=56mm $\therefore Volume = \frac{\pi}{6} \times 400(3 \times 56 - 2 \times 20)$ $= 26.5\ cm^3$ Volume of Cylinder $= \frac{\pi}{4}D^2L$ $= 28.26cm^3$ Total Volume = 28.26+(26.5)*2 = 81.26 cm^3 Weight of one rivet $= \frac{81.26 \times 8}{1000}$ $= 0.65\ kg$ No. of rivets which can be manufactured from 4kg M.S. $= \frac{4}{0.65}$ $\sim 6\ rivets$	**8 Marks**

MODEL ANSWER
WINTER– 17 EXAMINATION

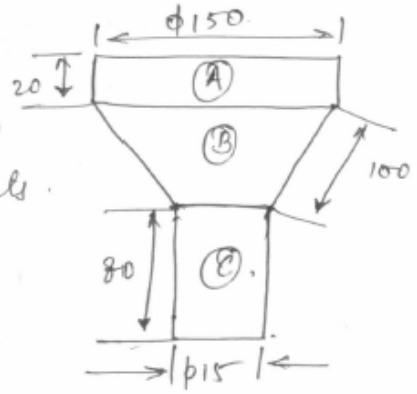
Subject Title: Estimation and Costing Subject Code: 17557

c)	Here N = 10 yrs. C = 1,00,000/- S = 25,000/- ∴ C-S = 100000 - 25000 = 75000/- ∴ Loss in cost of lathe in 10 yrs = 75000 life of m/c in hrs = 10 x 365 x 16. ∴ Depreciatn per hr = $\frac{75000}{10 \times 365 \times 16}$. ∴ Rate of depreciatn annually = $\frac{75000}{10 \times 365 \times 16} \times 5840$. (m/c works for 5840 hrs in a yr.) = 7500. ∴ Rate of depreciatn/yr = Rs 7500.	**8 Marks**

MODEL ANSWER
WINTER– 17 EXAMINATION

Subject Title: Estimation and Costing Subject Code: 17557

3)	**Attempt Any Two**	**2 X 8 =16**
a)		**8 Marks**



Consider the funnel divided into 3 parts.

A (Cylinder)

B (Frustum)

C (Cylinder).

∴ Surface area of

$$A = \pi D \times h$$

$$= \pi \times 150 \times 20$$

$$A = 9.42 \times 10^3 \text{ mm}^2 \quad -(1)$$

∴ Surface area of B $= \pi (r + R) l$

$$= \pi \left(\frac{150}{2} + \frac{15}{2}\right) \times 100$$

$$B = 25.91 \times 10^3 \text{ mm}^2 \quad -(2)$$

∴ Surface area of

$$C = \pi D \times h$$

$$= \pi \times 15 \times 80$$

$$C = 3.76 \times 10^3 \text{ mm}^2 \quad -(3)$$

Total Surface area = A + B + C

$= (9.42 \times 10^3) + (25.91 \times 10^3) + (3.76 \times 10^3)$

$= 39.09 \times 10^3 \text{ mm}^2$

As the thickness of MS sheet is 2mm.

∴ Total vol. of material = Total surface area × thickness

$= 39.09 \times 10^3 \times 2$

Total vol. of material $= 78.18 \times 10^3 \text{ mm}^3$

b) **8 Marks**

Given,
length of shaft = 160 mm
Width (w) = 20 mm (width of grinding wheel)
S = 16.5 m/min
Depth of cut = 0.25 mm
Initial Dia = 42 mm, Final dia = 40 mm

i) No. of cuts required $= \frac{\text{Initial dia} - \text{Final dia}}{2 \times \text{Depth of cut}}$

$= \frac{42-40}{2 \times 0.25}$

$= 4$ cuts

ii) Time required/cut :

length of cut (L) = 160 + 5 (assume over travel = 5mm)
= 165 mm
= 16.5 cm

Feed/rev. $= \frac{w}{2}$ (for rough grinding)

$\therefore F = \frac{20}{2} = 10\text{mm} = 1\text{cm}$

$N = \frac{1005}{\pi D} = \frac{100 \times 16.5}{\pi \times 4.2} = 125.05$ rpm

$\therefore$ Time required/cut $= \frac{L}{F \times N} = \frac{16.5}{1 \times 125.05}$

$= 0.132$ mins

iii) Total time required for 4 cuts = 0.132×4
$= 0.528$ mins $= 31.68$ secs

c) **8 Marks**

Since upsetting method is used, therefore only head is forged.
In this case it is a square head (from figure).

Volume of square head = Area of square head × length of square head

$= 4 \times 4 \times 1.5$

$= \underline{24}\ cm^3$

Volume of bolt shank = Area × length

$= \left(\frac{\pi}{4} \times d^2\right) \times 5.5$

$= \left(\frac{\pi}{4} \times 2^2\right) \times 5.5$

$= \underline{17.27}\ cm^3$

∴ Total volume of bolt = Vol. of head + Vol. of shank.

$= 24 + 17.27$

$= \underline{41.27}\ cm^3$

In forging this bolt only "scale loss" will occur, assuming it 6% of of the total volume.

∴ Volume of bar stock required $= 41.27 \times 1.06$

$= \underline{43.74}\ cm^3$

Note: Students can assume scale loss as 5% also.

Therefore, length of bar stock

$$\text{length} = \frac{\text{Volume}}{\text{Area of bar}}$$

$$\therefore \text{length} = \frac{43.74}{\frac{\pi}{4} \times (2)^2}$$

∴ **length of bar required = 13.92 cm**

MODEL ANSWER
WINTER– 17 EXAMINATION

Subject Title: Estimation and Costing Subject Code: 17557

4)	Attempt any two	2 X8=16
a)	**i)Costing:** Costing has been defined by Institute of Cost and Works Accountants, England as: " The technique and process of ascertaining costs" **OR** It is the determination of an actual cost of an article, after adding different expenses incurred in various departments. **Objectives:** • To determine cost of article • To determine cost of incurred during each operation • To provide information to ascertain selling price of product • To supply info for detection of wastage • It helps in reducing total cost of manufacturing • It suggests, changes in design, when cost is higher • To help formulating the policies • To provide info for economic consideration for purchasing new machines • To help management in decision making • To facilitate preparation of estimate for tender • To compare actual cost with estimated cost. **ii)Fixed Price Method:** In this method, issued material is charged at a predetermined estimated price, for a fixed period. Mostly for one year one rate is charged. Therefore, receipts and issues are recorded in quantities only which make store-keeping easy. This method is also known as "Standard Price" method. Price is generally fixed on the basis of past experience and future trends. **Application.** This system is mostly used where the fluctuations in the market price are very less and few.	**1 Marks for any one Definition** **3 Marks for any 3 points** **4 Marks**

MODEL ANSWER
WINTER– 17 EXAMINATION

Subject Title: Estimation and Costing Subject Code: 17557

b) **8 Marks**

$S = 15.4$ m/min

$F = 1$ mm/rev $= 0.1$ cm/rev

Depth of cut $= 3.5$ mm $= 0.35$ cm

(i) Reduce diameter from 3.5 cm to 2.8 cm for length = 16 cm

No. of cuts $= \frac{3.5 - 2.8}{2 \times 0.35} = 1$ cut.

$N_1 = \frac{1005}{\pi D_1} = \frac{100 \times 15.4}{\pi \times 3.5} = 140.05$ rpm

$T_1 = \frac{L_1}{F \times N_1} = \frac{16}{0.1 \times 140.05} = 1.142$ mins

(ii) Reduce diameter from 2.8 cm to 2.1 cm for length = 5 cm

No. of cuts $= \frac{2.8 - 2.1}{2 \times 0.35} = 1$ cut

$N_2 = \frac{1005}{\pi D_2} = \frac{100 \times 15.4}{\pi \times 2.8} = 175.07$ rpm

$T_3 = T_2 = \frac{L_2}{F \times N_2} = \frac{5}{0.1 \times 175.07} = 0.28$ mins

$\therefore T_2 = 0.28$ mins

Now, $T_3 = T_2 = 0.28$ mins (Since material removed from both sides for same dimensions)

(iii) Total time required to turn 35 mm diameter bar is,

$T = T_1 + T_2 + T_3$

$T = 1.142 + 0.28 + 0.28$

$T = 1.702$ mins

$T = 102.12$ secs

c) **Factors for Estimating erection cost:** **8 Marks**

At the job site, the main function of the erection team is to receive the components, store them, protect them from damage, preserve them during storage to sustain the original condition and assemble them with the permissible limit/tolerance specified in the standards handbooks to achieve determined performance during operation. Around 5600MT of pressure parts components per unit are dispatched loose to the job site by road/rail. Hence, it becomes all the more important for the job site erection team to take utmost care right from the receipt stage to completion of erection, so that commissioning activities proceed without any difficulties. A project gets completed successfully only when the 3 M's viz. Men, material and machines/devices associated with it are well co-ordinated and accounted for. Hence, elements for costing involves;

i) The machines/devices associated during a typical erection work are listed below for reference which may be fully owned by the concerned party but are usually preferred on hire basis

S. No.	Description
1.	Electric winch 10 ton capacity (for drum)
2.	Electric winch 3 or 5 ton capacity (for U rod)
3.	Wire Ropes 1400 M length, 25 mm dia. 6 x 37 construction IWRC and right lay (for Drum)
4.	Wire rope 400M length, 19 mm dia. 6 x 37 construction, IWRC and right lay (for U rod)
5.	10 sheeve 100 ton pulley block
6.	Single sheeve 10 ton pulley block
7.	3 ton or 5 ton chain pulley block
8.	3 ton pulling and lifting machine
	Or
9.	Wire rope 26 or 28 mm dia. 6 x 37 construction and IWRC. a) 40 mm length for lashing 10 sheeve pulley with cat band structure b) 80 M length for lashing 10 sheeve pulley with drum.
10.	Forged steel bull grips to suit the dia. Of rope

S. NO.	CATEGORY
1	Fitters
2	Riggers / Khalasi
3	Welders
4	Tack – Welders
5	Grinders
6	Gas Cutters
7	Electricians
8	Helpers
9	Radiographer

ii) The men in the team may comprise of technical officers of the parent company but third party expertise (on contract basis) may also be utilised along with in house and other contract labour as listed below:
The material viz. the pressure vessel concerned may be required to be prepared for erection phases viz. Hauling, hoisting, etc. for which additional components may be needed and attached as per on site conditions in addition to such similar functional parts provided on the vessel during fabrication stage. With this knowledge the stages of erection could be pre planned and applying the basics of costing the cost estimation may be forecast for the above erection project. The figure next shows the basic **cost elements** associated in estimation costing problems.

5)	**Attempt Any Two**	**2X 8 =16**
a)	**i)Forging Losses:** There is certain material which is lost during the forging operation on account of oxidation of metal and hammer blows which are termed as Forging Losses. Various forging losses are;	**4 Marks**

(*i*) **Tong Loss.** While performing forging operations, some length of stock is required for holding the job in tong. This length is an extra length, which is removed after completion of the job. For estimation purposes, the weight of this extra length is also considered and is known as Tong loss. This loss may be taken as 2 to 3 cm of the stock length.

(*ii*) **Scale Loss.** The outer surface of the hot metal is generally oxidised, and when hammering is done oxidised film is broken and falls down in the form of scale. It reduces the dimensions of the job, and therefore, this loss must be considered for estimation purposes. Generally, it is taken as 6% of the net weight.

(*iii*) **Flash Loss.** It is the surplus metal, which comes out between the two meeting surfaces of the dies. The surplus material will be all around the periphery of the dies. For getting finished product, this surplus metal is required to be trimmed off.

This loss may be calculated by assuming it to be 20 mm wide and 3 mm thick all around the periphery of the dies.

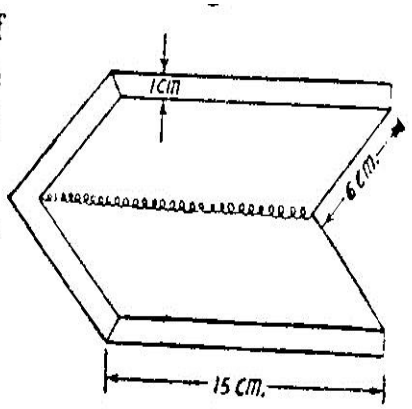
Thus, volume of flash loss = Periphery $\times 20 \times 3$ cu mm nearly.

(*iv*) **Shear Loss.** The required sizes of workpieces for forging operations are obtained from long bars by sawing or shearing. In sawing operation, some material, is always lost. If last piece of bar is not to the required length, it is rejected. This loss of material is taken as 5% of the net weight.

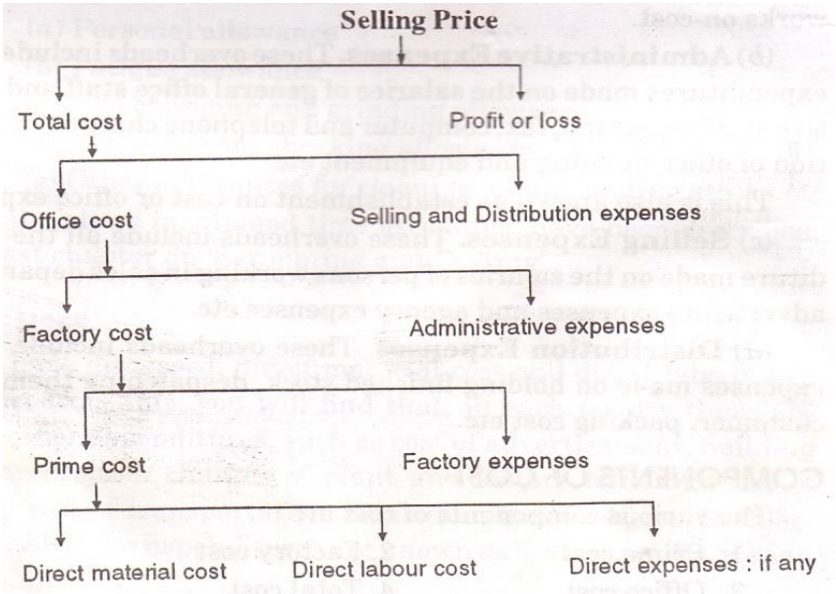
(*v*) **Sprue Loss.** The portion of metal between the length held in the tong and the material in the die is called sprue. This is also a metal loss and can be taken as 7% of the weight.

Thus, we can see that nearly 15—20% of the net weight of metal is lost during forging. Therefore, in estimation their consideration is very essential and total weight will be net weight of job plus sum of the weight of different losses occurred during forging. Thus this gives the amount of weight of material required for forging.

	ii)Forging operation: The shape of material can be transformed by forging with the aid of the following operations: **1. Drawing Down**- It is also known as Drawing Out. This operation is performed to increase the length of the workpiece in forging by decreasing the cross-sectional area.This process is performed by hammering the hot workpiece lengthwise to reduce cross-section. **2. Up Setting**- This is the reverse of Drawing Down operation.In this operation, the cross-section of the workpiece is increased at the expense oflength. This process is performed by hammering one end of hot workpiece while other end is supported against the anvil. **3. Bending**- Bending is done by holding the workpiece between two fixtures and desired bend can be given by striking the workpiece with the help'of hammer, This operation can also be carried out on the anvil beak. **4. Punching and Drafting**- Punching operation is perfcrmed by a tool called punch, for producing holes in the workpiece, when it is in the hot state ; and drafting is an operation carried on by a special tool known as draft to enlarge the hole.	**4 Marks**
b)	**i) Importance of mensuration:** For correct calculation of weights of material, an estimator should have good knowledge of mensuration. With the knowledge of mensuration an estimator calculates areas, volumes, weights and hence determines cost of material (i.e. with the available on going rate/kg for that material) Therefore, careful study of mensuration is essential and the estimator should always remember the concerned formulaes to arrive at the material cost because experience has shown that material cost is about 25% to 65% of the total production cost. **ii)Obsolescence :** When new fixed assets' quality, efficiency and capacity decrease the value and usability of old fixed assets, then it is called obsolescence of old fixed assets. The main example, we can look in different machines or technical equipment especially in medical field. Every new equipment decreases the value of previous equipment. Because of it is not related to the nature and use of fixed asset, so it is also not depreciation. Obsolescence is not important in field of accounting but it is important in technology research and marketing of product. **Major Causes of Obsolescence:** (a) Changes in product design. (b) Rationalisation. (c) Connibalisation.	**4 Marks** **2 Marks** **2 Marks**

	(d) Faulty Planning and Forecasting (e) Faulty Purchase Practices (f) Other Reasons	
c)	**Solution.** As the thickness of the plates to be welded is more than 5 mm, therefore, rightward welding method is adopted. From table, for 10 mm thick plates : O_2 consumption = 0.7 cu. m/hr. C_2H_2 consumption = 0.5 cu. m/hr.  Fig. 14.6 Filler rod dia = 5 mm Length of filler rod required 4.5 m/m of welding. Welding time = 30 min/m of welding. ∴ Time required to weld 15 cm length $= \frac{15}{100} \times 30 =$ **4.5 min.** (*i*) Amount of oxygen consumed @ 0.7 cu m/hr $= \frac{4.5}{60} \times 0.7 = 0.053$ cu. m. ∴ Cost of oxygen @ Rs. 10/cu. m $= 0.053 \times 10$ = **Re. 0.53.** (*ii*) Now, amount of C_2H_2 consumed in 4.5 min	**8 Marks**

	@ 0.5 cu. m/hr = $0.5 \times \frac{4.5}{60} = 0.0375$ cu. m ∴ Cost of $C_2H_2 \equiv$ Rs. 60/m^3 $= 0.0375 \times 60 =$ **Rs. 2.25.** (*iii*) Length of filler rod required for 15 cm job @ 4.5 m/metre welding $= 0.15 \times 4.5 =$ **0.675 m.** But for 10 mm thick plates, filler rod dia = 5 mm. ∴ Weight of filler rod consumed = Volume × Density $= \frac{\pi}{4}(0.5)^2 \times 67.5 \times 7$ gm = 92.8 gm **= 0.0928 kg.** ∴ Cost of filler rod @ Rs. 12/kg $= 12 \times 0.0928 =$ **Rs. 1.11.** ∴ Total material cost $= 0.53 + 2.25 + 1.11 =$ **Rs. 3.89. Ans.**	
6)	**Attempt any two**	**2 x 8 =16**
a)	**i) Factors Affecting welding costs and welding cost estimation:** There are certain factors which affect largely on the welding cost. These factors are as follows. i. Time required for handling and setting the job and equipment in correct position ii. Time required for fixing fixtures. iii. Rest and fatigue time allowance. iv. Excessive welding. When excessive current is used, welding cost also increases. **ii)Preparation of blank layout for sheet metal production:** For preparing an article, layout is required to be done on the sheet metal first. For this purpose an outline of the object is drawn or scratched on the sheet metal directly. Sheet is cut in accordance with layout and then different other operations are performed on it to give required shape of the article. At the time of layout allowances must be kept for different operations like, raising, wiring, jointing, hemming etc.	**4 Marks** **4 Marks**
b)	**i) Selling Price:** If the profit is added in the total cost of the product it is called 'Selling Price'. The customers get arcticl;es by paying price which is named as Selling Price. The fololwing diagram explains how to obtain 'Selling Price'	**1 Mark**



3 Marks

ii)**Differentiation between Costing And Estimating**

No	Costing	Estimating
1)	Costing is the determination of actual cost of the product by adding various elements of expenses incurred	Estimation is aimed to calculate the probable cost of product before the manufacturing starts
2)	Costing requires the knowledge of accounts and therefore costing is done by accountants	Estimation requires a highly technical knowledge, hence an estimator is basically an engineer
3)	Costing tells after the manufacture about profitability of the product	Estimation forecasts about the probable cost and hence one can know before the manufacture that manufacturing of product shall be profitable or not, whether one should manufacture it or not
4)	It determines cost of each article included in the product	It predetermines the cost of whole product
5)	It supplies information for detection of wastages	It cannot supply information for detection of wastages.

4 Marks for any 4 points

c)	i) **Process accounting: Following are the characteristics of process cost accounting** • The output consists of product which are homogenous • Production is carried on in different stages having continuous flow • Production takes place continuously except in cases where the plant and machinery are shut down for maintenance etc. • The input will pass through two or more processes before it takes shape of the output. • The output of the process may also be saleable in which case the process may generate some profit. • The input of process may be capable of being acquired from outside sources. • The output of a process is transferred to next process generally at the cost of process. • Normal and abnormal losses may arise in the process **ii)Job Order Costing & Process Order Costing:** **Job Order Costing:** It is used by manufacturers who make special orders, customized products, or standard products produced in batches. Here costs are accumulated by job. Cost to make one Unit in one department = Cost of the Job / No. of units produced in the job **Process Order Costing:** It is used by manufacturers who mass produce large quantities of identical units in a continuous flow. Here costs are accumulated by department for a time period (for example one month Cost to make one Unit in one department = Department's Cost for the Month / No. of units produced during the month	**4 Marks for any 4 points** **2 Marks** **2 Marks**