Model Answer: Summer 2017

Subject: Contracts and Accounts

Sub. Code: 17603

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 the candidate and those in the 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 the 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.

Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.1	**a)**	**Attempt any <u>THREE</u> of the following:**		**12**
	(i)	**Write the two Functions of superintending Engineer& Executive engineer in construction work.**		
	Ans.	<u>Functions of superintending Engineer(SE):</u> 1. Administrative approval to the work under his control. 2. Technical sanction to estimate within his power, 3. Inspect work in his circle. 4. Arrange payment of store and material. 5. Inspect division in his circle and report to chief engineer. 6. To check progress of work under his circle. 7. Financial control over execution of original repair work	**1 Mark each (any two)**	**4**
		<u>Function of Executive Engineer / Divisional officer (EE) :</u> 1. Inspect sub divisional office once in a year 2. Execution of work under him. 3. Ensures all tools plants and machinery are properly maintained. 4. Invite tender for work valued within his power 5. Maintenance of accounts. 6. He is responsible for preparation of project design, estimate etc. 7. Keep close watch on expenditure. 8.	**1 Mark each (any two)**	
	ii) **Ans.**	**Write the objects of contract.** **Objects of contract are-** 1. To complete the work in time. 2. For economical completion of the work. 3. For good Quality of work. 4. To have healthy competition among the contractor. 5. To get work done from experienced person.	**1 Mark each (any Four)**	**4**

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.1	**a) ii)**	6. To use advanced equipment's and techniques for the work 7. To carry out the work as per specification		
	iii)	**State the various documents required for registration of contractor in PWD.**		
	Ans.	The applicant has to submit the following documents along with his application. 1. Latest income tax clearance certificate 2. Proof of financial status 3. Solvency certificate 4. List of machinery with their condition 5. List of technical staff employed along with qualification and experience 6. Professional capacity and experience certificate 7. Attested copies of partnership deed if any 8. Registration fee	**1 mark each (Any Four)**	**4**
	iv) **Ans.**	**Enlist only tender documents.** **Tender documents are-** 1. **Title page :** It contains name of work, contract bond number, etc. 2. **Index page :** It contains list of contents of agreement with page references. 3. **Tender notice :** It is the notice published in the newspaper inviting tender. 4. **Bill of Quantities OR Schedule of Quantities** – Schedule – B 5. **Schedule of issue of materials :** Schedule – A 6. **General specification :** Specifying the class and type of work in general 7. **Detailed specification:** Guidelines about material, workmanship and measurements. 8. **Drawings :** It is a complete set of drawings 9. **Conditions of contract :** Containing terms and conditions of contract in detail. 10. **Special conditions :** Depending on nature of work taxes, royalties, compensation to labours etc.	**1 mark each (Any Four)**	**4**
	v) **Ans.**	**Explain the term "Subletting of Contract".** 1. It is letting out a portion of main work by the main contractor to subcontractor to carry out that portion of work 2. Subletting of work in part or whole is not permissible unless the owner or the department gives written permission.		

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.1	v)	**3.** Subletting creates problems in fixing the responsibilities of work as well as for settling the accounts of work, compensation to paid to the workers if any.	**1 mark each (Any Four)**	
		4. In case of sickness, financial difficulties of the main contractor or if the work is of special nature then subletting is desirable.		**4**
		5. For delay, inferior quality work & penalty etc. the main contractor is held responsible		
	b)	**Attempt any <u>ONE</u> of the following:**		**6**
	i)	**Explain the item rate contract method in detail and state the situation where it is used.**		
	Ans.	In this contract method, the contractor quotes rate for each and every item of work. The approximate quantities worked out and given in bill of quantities. The contractor quotes rate against each item and makes a final total of the amount of work. The basis of agreement is the unit rate of each item. Rate of contractor includes, rate of material, labour, overhead cost and profit. This contract is useful especially when the quality of work is essential and the exact quantities are not known.		
		Advantages - 1. Changes / variations are possible in the Quantity of work. 2. The actual amount of work as per unit rate Quoted is paid. 3. Delay in preparation of drawings and other documents is avoided. 4. Chances of extra works are avoided. 5. There is risk to the contractor therefore Quality of work is assured. 6. The contract allows extra (work) /items.	5	
		Disadvantages - 1. The owner is not sure about the total cost of work till the completion. 2. Both owner and contractor have to appoint staff. 3. There is possibility of unbalanced tender. 4. The extra items may cause dispute between owner and contraction		6
		Situations where it is used : For all types of public and government works like building, roads and bridges etc.	1	

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.1	**ii) Ans.**	**Explain the term security deposit and earnest money.**		
		Security deposit:		
		It is the amount of money deposited as a security of work by the contractor for certain period of time.		
		Usually the % of security deposit is 10%.		
		The SD is refunded to the contractor after defect liability period is over.	**3**	
		This amount is useful as a check on contractor for fulfilling all terms and conditions of contract including quality and time limit.		
		It is refunded in two stages :		
		(a) 50% after virtual completion of work.		
		(b) 50% after the completion of defect liability period		
		Earnest money:		**6**
		It is the initial deposit paid with the tender in order to show the earnest desire of the contractor to take up the work if awarded.		
		An amount equal to 1% to 2% of the estimated cost is taken as EMD.		
		This amount remains in the safe custody of the owner or department. The amount carries no interest.	**3**	
		After opening of tender EMD of all unsuccessful contractor is refunded.		
		The main purpose of EMD is to maintain healthy competition between the bidders.		
		EMD is accepted in cash, DD etc.		
		The EMD of successful contractor is converted into security deposit		

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.2		**Attempt any FOUR of the following:**		**16**
	a) Ans.	**Draw the administrative set up chart of PWD.**		
		Government	1	
		Secretary to Government		
		Chief Engineer		
		Superintending Engineer (S.E.) Circle-1, S.E. Circle-2, S.E. Circle-3, S.E. Circle-4	1	
		Executive Engineer (E.E)		
		Assistant Executive Engineer (AEE)		**4**
		Assistant Engineer (A.E) /SDE/Deputy Engineer	1	
		Junior Engineer		
		Supervisor (Technical Asst.)		
		Skilled workers, Semi-skilled workers, Unskilled workers	1	
	b) Ans.	**Define terms administrative approval and Technical sanction.**		
		Administrative approval:		
		For any work, it is necessary to take formal acceptance with respect to cost and work from the government. For this purpose the department sends a proposal to government for taking up the work. After considering all aspects like feasibility of project, financial aspect etc. The government accepts proposal. "The formal acceptance of the proposal by the government is called administrative approval".	2	**4**
		Technical sanction: Technical sanction means the sanction of the detailed estimate, design, rates and cost of work.by the competent authority. The work is taken for the execution only after the technical sanction.	2	

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.2	**b)**	The govt. has delegated powers of technical sanctions to the officers in PWD. **E.g C.E- Full power** **SE -25 lakhs**		
	c) **Ans.**	**State classes of contractors and their capacities in PWD.** The classes of contractor is given by competent authority depending upon technical capability and financial status contractors are classified as given below- **Classes and capacities (limit)** Class I : No limit Class II : Upto 750 Lakhs Class III : Upto 300 Lakhs Class IV : Upto 150 Lakhs Class IV-A : Upto 90 Lakhs Class V : Upto 50 Lakhs Class VI : Upto 15 Lakhs Class VII : Upto 7 Lakhs (Note- Current limits may vary with the above figure and should be considered)	**4**	**4**
	d) **Ans.**	**Explain B.O.T project & give any two examples.** B.O.T. is a form of project where government grants permission to private firm to construct and administrate certain public infrastructure by financing and authorizing them to pay off loans reclaim investment by allowing them to collect tools, fees, rent as stated in contract and after concession period is over, ownership is transferred back to government. It encourages private investment. It promotes foreign investment, techniques and technology in country. **Objects of B.O.T.** 1) To encourage private investment. 2) To promote foreign investment, techniques and technology in country. **Examples:** i) Mumbai – Pune express highway ii) Baroda – Ahmadabad highway (NH8). iii) Nagpur Express highway (NH50)	**2** **1** **1**	**4**

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.2	**e)**	**State uses of NMR and imprest cash in PWD accounts**		
	Ans.	**Imprest Cash:** i) In P.W.D individual officer are given a permanent advance of Rs. 1000/- for the petty expenses & to make payment in connection with government work. ii) From this amount they can pay transport charges, miscellaneous payment of materials .Accounting of these works is known as imprest cash account.	**1 Mark each (any two)**	**4**
		NMR: i) It is used to mark the attendance of labour employed departmentally. ii) It can be used to make the payment of departmental labour. iii) To keep record of paid & unpaid wages	**1 Mark each (any two)**	
	f)	**Discuss about pretty advance and retention money. Give the situation under which it is given**		
	Ans.	**Petty advance:** It is a small amount paid as advance to the engineer in charge for purchasing materials in case of emergency. No Quotation & approval is required to purchase.	**1**	
		Suitability: i) This is used for purchasing of materials in case of emergency. ii)The quantity should be less & cost of purchase of material should not exceed Rs. 10.	**1**	
		Retention money: It is amount of money or sum retained with the owner or department from the running account bills to have additional hold on the contractor so that he will not be encouraged to abandon the work when nearing completion. The amount retained from monthly payment may be 10 to 15 % .If the contractor fails to rectify the defects during defect liability period then this amount maybe used to rectify defect.	**1**	**4**
		Suitability: i) To rectify defects ii) Left out work can be executed by this money. iii) To meet the damages if any.	**1**	

Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.3		**Attempt any FOUR of the following:**		**16**
	(a) Ans	**Explain the schedule 'A' form. State its two uses.**		
		Schedule A-		
		Schedule A is statement showing details of materials supplied to contractor by PWD store, and the rate at which materials are to be charged. The particulars commonly shown in schedule 'A' are :(i) Description of material to be supplied.(ii) Approximate quantity (iii) The rates at which the materials will be charged and (iv) The place of delivery of the material	2	
		Format of Schedule A	1	4

Particulars	Quantity	Unit	Rates at which materials will be charged to contractor		Place of delivery
			In Figure	In words	

Use of Schedule A-
1) It gives list of material supplied by the department to the contractor
2) It gives the amount charged to the contractor for procurement of materials

	(b) Ans	**Define Escalation of cost and arbitration.**		

Escalation of cost-
Escalation of cost is defined changes in the cost or price of specific materials in a given economy over a period. The Completion period of big project work is usually long & the cost of materials and labors becomes more and more day by day. It is therefore difficult for a contractor to forecast such future increase in rates. In order to overcome such drawback price escalation clause is provided which is known as Escalation of cost.

Marks for above: 1 (Use), 2 (Escalation), 4 (Total)

Arbitration-
During execution of work owner and contractor may come across situations where disputes may arise. The process of settling the dispute between owner and contractor is called as arbitration.

Marks: 2

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.3	**(c)** **Ans**	**Define the term unbalanced tender. Give one example.** In case of unit price contract the contractor has to quote his rate for each item. If these rates quoted by contractor are reasonable, the tender is known as balance tender. But sometimes the contractor puts up higher rates for certain items and lower rates for other items so that the total amount of tender remains practically unaffected, such a tender is known as unbalanced tender. The contractor quotes higher rates for those items which are to be completed in the early part of work so that he gets slightly excessive payment from which he can build up working capital. Following is the example of unbalanced tender :	**2**	**4**

Item No.	Particulars of Item	Qty.	Tendered rates in Rs.		
			P	**Q**	**R**
1.	Excavation in soft soil	500/m^3	Rs. 40/- m^3	Rs. 12/- m^3	Rs. 30/- m^3
2.	Excavation in soft	300/m^3	Rs. 40/- m^3	Rs. 25/- m^3	Rs. 60/- m^3
3.	Excavation in hard	200/m^3	Rs. 40/- m^3	Rs. 80/- m^3	Rs. 100/- m^3
4.	C.C. bedding 1 : 4 : 8	100/m^3	Rs. 400/-m^3	Rs. 500/- m^3	Rs. 300/- m^3
5.	Plastering in C.M. 1 : 4	800/m^2	Rs. 10/- m^2	Rs. 20/- m^2	Rs. 8/-m^2
6.	Oil painting	500/m^2	Rs. 10/- m^2	Rs. 10/- m^2	Rs. 5/-m^2
	Total for the items		Rs. 95.000/-	Rs. 1,00,500/-	Rs. 1,11,900/-
	Remarks		Lower	Second	Third

Here the contractor P has quoted very high for item no. 1 and very low rate for item no 3. He expects by his judgment after visiting the site and by his experience that the quantity of excavation in soft exceeds the estimated quantity double and the excavation in hard rock and soft rock is negligible.

(Note: Any two items related with civil engineering works could be considered as examples.)

The marks for the lower part **2** appear in the Marks column.

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.3	**(d)** **Ans.**	**Differentiate between percentage rate contract and item rate contract with respect to four points.** (table below)	**1 Mark each**	**4**

Sr. No.	Percentage rate contract	Item rate contract
1	In this contract, the contractor agrees to carry out the work at a certain percentage below or above the estimated cost.	In this contract, the contractor agrees to work as per the rates quoted by him for each item.
2	This is useful for the work of all nature with no item-wise rates.	This is useful when the quality of work is required and also quantities of work to be executed are not known previously.
3	Suitable for all type of government as well as private.	Suitable for most of public works executed by government departments.
4	It is easy to prepare comparative statement.	It is difficult to prepare comparative statement.

	(e) **Ans**	**List any four types of contract with their suitability.** **Following are different types of contracts.** 1. **Lump sum contract**- This type of contract is suitable for small work 2. **Item rate contract**- It is suitable for large work. The item rate contract is most commonly used for all types of engineering works financed by public or government bodies 3. **Percentage rate contract**- It is suitable for all types of Private and government work. 4. **Labour contract**- It is suitable when materials to be arranged and supplied by owner and contractor only engage labours. 5. **Demolition contract**- This type of contract includes the demolition and the removal of structure and its component parts and disposal of demolished material. 6. **Negotiated contract**-This type of contract is suitable for work where time is important and work has to complete at short notice	**1 mark each (any four)**	**4**

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.4	**a)**	**Attempt any THREE of the following.**		**12**
	i) **Ans.**	**Define the term bill and Voucher.** **Bill-** Bill is the account of work done or supply of materials made, and included the particulars and quantities of work done or material supplied their rates and amount. **Voucher-** Voucher is a written document with details which is kept in record as a proof of payment.	2 2	4
	ii) **Ans.**	**Write four circumstances under which lowest tender is rejected.** The following are the situation when the lowest tender is rejected; 1. When tender is not submitted in particular form sold by department. 2. The lowest tenderer may lack in experience for work. 3. Earnest money is not enclosed along with tender. 4. Unsatisfactory reputation of lowest tender. 5. In adequate finance to execute work. 6. Inadequate connection of fair rates is not received. 7. Tender is not signed by contractor. 8. If any page is removed from document. 9. If contractors is black listed by any department.	1 Mark each (any four)	4
	iii) **Ans.**	**State the importance of specification** The Importance of specification: 1. The cost of a unit quantity of work is governed by its specification. Specification specifies method of doing work; thus specification serves as a guide to the supervising staff. 2. Contractor is paid only when the work is carried out according to the specification. 3. Any changes in specification changes the tendered rate. 4. Tender paper without specification is incomplete and invalid.	1 mark each	4
	iv) **Ans.**	**State the meaning of Speculative Value and Sentimental value.** **Speculative Value-** Some property dealers have their business of purchasing of properties and selling them at profit after some time. the price at which such property is purchased with intention of selling it again at profit, is known as Speculative Value **Sentimental value-** In some cases, some sentiments or feelings of the owner are attached and he does not desire to sell even the buyer may pay much more than actual value of property. such offered price is called as Sentimental value	2 2	4

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.4	**b)**	**Attempt any ONE of the following.**		**6**
	(i) **Ans.**	**State the requirements of valid contract.** Following are the requirements of valid contract; 1. Contract should be in writing and should be signed by both the parties i.e. owner and contractor. 2. The subject matter of agreement must be legal and definite. 3. If situation arises the contract can be enforced in court of law. 4. Parties should be competent enough to carry out work. 5. Both parties must give their free consent to do work. 6. Contract should be attested by responsible officer.	**1 mark each**	**6**
	(ii) **Ans.**	**State one use of measurement book, indent and invoice also draw their format in tabular form** **Use of Indent:** 1. Procurement of material from store. 2. Materials from the stock are issued on demand **Format of Indent-**	**1 mark each (any one)**	
			1	

form no. 7- Indent for Stores				form no. 7- Indent for Stores			
Counterfoil				**Indent**			
Indent no.				Indent no.			
On ……..				On ……..			
Date …..				Date …..			
Description	No. / Quantity	Head of Account	Name of work with name of contractor	Description	No. / Quantity	Head of Account	Name of work with name of contractor
The store should be delivered to Intending Officer				The store should be delivered to Intending Officer Certificate of Supply This indent has(not) been supplied with in full……………. Delivered to……….on…….by……………dated ……. Supplying Officer			

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.4	**(ii)**	**Use Measurement Book (M.B.):** 1. It is the book in which measurement of all works and supplies are recorded. 2. All the payment of all works is done based on entries done in measurement record. **Format of Measurement Book**	**1 mark each (any one)**	
			1	**6**

Format of Measurement Book

Item no.	particulars	no	L	B	D/H	Quantity	Total Quantity

Use of Invoice-
   1. It is used as a token of acknowledgement of the receipt of goods.
   2. The issuing officer issues the material available in stores and then fills the invoice as actual goods issued.

1 mark each (any one)

Format of Invoice-

form no. 7- Invoice			
Invoice for stores Supplied			
To…..			
By……..			
On Indent no…….. Date……			
Issued by the………………			
Description	No. / Quantity	Head of Account	Name of work with name of contractor
Dated…….. Received… Supplying Officer Dated…. Receiving Officer			

1

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.5		**Attempt any TWO of the following**		**16**
	a)	**Draft a tender notice for construction of Principal's Bungalow for Government Polytechnic Pune -16, costing Rs. 25 Lakhs Assume suitable data**		
	Ans.	**Assumptions :**		
		1. Authority inviting tender is Executive Engineer.		
		2. Situation at Pune.		
		<u>Tender Notice</u> (Public works Department) No. : Date : Sealed item rate tenders in form B_2 are invited by executive Engineer Public works department, Division Pune from registered contractors in appropriate class for the following work.	1	

Sr. No.	Name of work	Estimated cost in Rs.	Earnest money in Rs.	Security Deposit in Rs.	Time of completion
1.	Construction of Principals Bungalow for Government Polytechnic Pune -16	25,00,000	25000	1,25,000/-	18 months

		Marks	Total Marks
(table above worth)		3	8

     Blank tender form at a non-refundable cost of Rs. 500/- (Rs. 600/- if required by post) can be obtained from the office of Executive Engineer P.W.D. Division No.__Pune, up to 4.00 p.m. during working hours on all working days. (Except Sunday and holidays) from …… to ……… Tenders will be received in office of Executive Engineer up to 3.00 p.m. on ……….. and shall be opened on the same day at 4.00 pm in presence of contractors who may like to attend.

     The right reserves to reject any or all tenders, without assigning any reasons.

3

<div align="center">Sd/-</div>
<div align="center">Executive Engineer</div>
<div align="center">Pune</div>

1

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.5	**b)**	**A building is newly constructed at the cost of Rs. 1,50,000 on a plot of 600 m². Fix monthly rent of this property from the following data -** **Rate of land Rs. 50 per sqm.** **Return expected on cost of land and building = 8%** **Life of building 60 years, rate of interest for sinking fund = 3%,** **Scrap value = 10% of construction cost.** **other outgoings = 30% gross rent.**		
	Ans.	**Given :** Cost of construction = 1,50,000 Cost of land @ Rs. 50 per sq.m (50 × 600) = 30,000 Total cost = 1,50,000 +30,000 = 1,80,000	1	
		Step 1 : To find total net return per annum : Return expected on cost of land and building 8% $= \dfrac{8}{100}$ x 1,80,000 $= 14,400$	1	
		Total net return per annum = 14,400/–	1	**8**
		Sinking Fund Installment $= S \times i/((1+ i)^n - 1)$ $= 135000 \times 0.03 / ((1+0.03)^{60} - 1)$ $= 828$	1	
		(ii) Other outgoings at 30% of Gross rent $= 0.3 \times x$ (assuming gross rent as x) Gross rent = Net return + outgoings. $x = 14,400 + 828 + (0.3x)$ $x = 15228 + 0.3x$ $\therefore \quad 0.7x = 15228$ $\therefore \quad x = 21,754.14$	1 1	
		Step 3 : To find rent per month : $\therefore$ Rent per month $= \dfrac{21754.14}{12}$ $= 1812.86 \approx 1813$	1 1	

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.5	**c)**	A property consisting of land and building fetches a rent of Rs12,000 per annum the building constructed in 1961. Total life of the building estimated to be 80 years. Calculate the capitalized value of the building assuming investment at 8% security and allowing redemption capital at 5 % Assume usual outgoings at 30%		
	Ans.	**Given :**		**8**
		Rent of Rs. 12000 / year ;		
		Life of building = 80 years ;		
		Security investment = 8 % ;		
		Redemption capital = 5% ;		
		Outgoings = 30% of rent ;		
		Capitalised value to be determined		
		Step 1 : To find net rent :		
		Gross rent = Rs. 12000 per annum		
		Present age of building = 2017-1961 = 56 Years		
		Future Life of Building = 80 − 56 = 24 Years		
		Amount of outgoings = 0.30 × 12000 = Rs. 3600/-	**3**	
		Net rent = 12000 − 3600 = Rs. 8400		
		The investment at 8% security and allowing redemption capital at 5%.		
		Using dual rate table years purchase $= \dfrac{1}{P+S}$		
		Where P = rate of interest on capital		
		S = sinking fund		
		Years Purchase $= \dfrac{1}{0.08 + \dfrac{0.05}{(1+0.05)^{24}-1}}$	**3**	
		= 9.7588		
		Step 3 : To find capitalized value of property :		
		∴ Value of property = 8400 × 9.7588	**2**	
		= 81,973.92		

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.6	**a)**	**Attempt any Four of the following:** **Draft a detailed specification for UCR masonry work in CM (1:4) for foundation work.**		**16**
	Ans.	The Detailed specification for UCR Masonry can be divided as i) Materials ii) Mortar iii) Laying iv) Measurement **(i) Materials :** (a) Stone : Stone shall be hard, able to dress, sound, free from decay, defect and weathering. Stones with pores and defects shall be rejected. Size of stone shall not be less than 150 mm in any direction. Stones will be dressed and brought to required size and shape. Stones with rounded surface shall not be used for the work (b) Sand or fine aggregate : Sand or find aggregate needed for mortar shall be as per the standard specification. Sand shall be well graded and sized, clean and free from dust ,dirt, and organic matter foreign matter (c) Cement : Cement for mortar shall be as per the standard specification. It shall be fresh shall be of uniform color and free from lumps. If doubtful it shall be checked and subjected to tests and used only after found satisfactory d) Water water fit for drinking purposes shall be used for construction purpose **(ii) Mortar :** Various ingredients of mortar shall be first mixed in prescribed proportion of 1: 4 with measuring box and first mixed dry to have uniform colour on water tight platform and then mixed wet at least three times by adding water evenly and gradually in appropriate proportion as specified. **(iii) Laying :** The foundation trench shall be clean properly and sprinkled with water • All the dressed stones shall be wetted thoroughly before laying in stone work. The walls shall be carried up in line and truly plumb. • Face stone shall not be narrower than that of its height	**1** **1** **1**	**4**

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Q.6	**a)**	shall tail back and bond well into backing .		
		• Stones shall be laid with break joint on the face for at least half the height with those of courses above or below.		
		• All joints after laying the stones shall be filled by mortar completely and thickness of joint shall not more than 20 mm.		
		• So as to prevent thick beds of joints and mortar, interstices between stones shall be filled with stone chips and spalls.	1	
		• Bond stones at least 450 mm long shall be given one for every half sq.m face in the interior thickness of the walls.		
		• Through stones (H) shall be approximately provided so as to have the key bonding in between facing and backing.		
		• The masonry wall shall be carried out together with a line and truly plumb so as to have uniform height.		
		iv) Measurement of stone work :	1	
		Measurement of UCR masonry shall be taken in cu.m.		
	b) **Ans.**	**Draft a detailed specification for internal Painting with 3 coats of dry distemper** **Cleaning** The surface to be painted shall be cleaned and made smooth by rubbing sand papers of different grades cracks loose plaster shall be bought up by plaster work and all the holes and undulations shall be filled up with plaster of Paris and rubbed smooth		
		Distempering The distemper shall be of best quality and the color should be as specified. The distemper should be mixed and prepared and water added as laid down in the instruction of the manufacturers. First a paste is made by adding little hot water to the distemper powder and stirred thoroughly and the paste is allowed to stand for a few minutes. The paste is thinned with water and stirred thoroughly all the time The surface must be perfectly dry before distempering is to be started. In new cement plaster the surface shall be washed over with a solution of zinc sulphate. In old surface the surface shall be repaired with plaster of Paris where required and then whole surface shall be washed and allow to dry	1	

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Q.6	**b)**	**Coating**		**4**
		the number of coats shall be two or three as specified,The distemper shall be kept well in stirred in containers and shall be applied with broad brushes first horizontally and immediately crossed vertically .Brushing should not be too long to avoid brush marks The second coat shall be applied after first and coat is dried up and after this final coat shall be applied Distempering should be carried out during dry weather but nor during too hot and wet weather	1	
		Workmanship		
		The distemper shall be applied in the best workmanship manner the brushes shall be of best quality and they shall be worked in such manner that a surface of uniform shade is obtained without any hair crack drops etc. after each days of work brushes shall be washed and kept dry.	1	
		Measurement		
		Distempering shall be taken in Sq.m stating number of coats and measurement shall be taken flat.	1	
	c) **Ans.**	**State different types of specification .Give the details of any one specification .**		
		Following are the various types of specification;		
		i. Brief specification		
		ii. Detailed specification		
		iii. Standard specification	2	
		iv. Manufacturers specification		
		(i) Brief specification: The general specification used for estimating the project is the brief specifications. The specification which gives the brief description of various items of work, specifying the materials, quantities, proportion of materials and gives general idea about the whole work.		
		OR	**2 marks for explanation (any one)**	
		(ii) Detailed specification: The specification in which detailed information of the various quantities of materials, procedure of workmanship to be adopted, nature and class of work is mentioned. The details specification describes the item of work in details, accurately and complete in all respects in relation to the drawings of the work.		

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Q.6	**c)**	**OR** **(iii) Standard specification**: Detailed specifications for various works are drawn up by an engineering department and these specifications are printed and used as a standard specification. Hence most of the items in works are made to standardized specifications. **OR** **(iv) Manufacturers specifications:** This type of specifications in which the properties of products such as strength, thickness, depth, elasticity, chemical composition etc. are mentioned.		**4**
	d) **Ans.**	**Define 'Sinking fund' and 'Years Purchase'** **Years Purchase:** It is the figure which when multiplied by the net income gives the capitalized value of a property on the material date of valuation. Capitalized value = Net Income x Year Purchase "Year Purchase is the capital sum required to be invested in order to receive an annuity of Rs. 100, at certain rate of interest." Y.P. = 100 / rate of interest or Y.P. = 1 / i	**2**	**4**
		Sinking fund: An amount which has to be kept aside at fixed intervals of time, out of the gross income so that at the end of the useful life of building, the fund should accumulate to the initial cost of the property is called as sinking fund. $I = Si / (1 + i)^{n-1}$ Where, S = amount of sinking fund i = rate of interval in decimal. n = number of years required to create sinking I = annual installment required	**2**	
	e) **Ans**	**Define depreciation. Give the four methods of depreciation** **Depreciation** The loss in the value of the property caused by its use, life, wear, tear and decay is called as 'depreciation'. **Methods of depreciation:** i. Straight line method ii. Constant percentage method or declining Balance method iii. Sinking fund method iv. Quantity survey method	**2** **(½ Mark each)**	