



Subject: Contract and accounts

Subject 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:		12M
	(i) Ans.	State any eight functions of Junior Engineer. Following are the functions of Junior Engineer (JE) : <ol style="list-style-type: none">1) To supervise the work in his charge2) Maintain attendance of daily work labours3) Taking measurement of all work in MB4) Prepares estimates for all types of works in his section5) Preparation of bills – running and final bills for work in his charge6) Carry out field survey for proposed project7) Carry out half yearly check of all stores in his charge and submit report to SDO.8) Report to higher authorities for irregularities in contract, specification, and shortage of supply of materials or any other difficulty during execution.	$\frac{1}{2}$ marks each (any eight)	4M
	(ii) Ans.	List any eight types of engineering contract. <u>Types of contract:</u> <ol style="list-style-type: none">i) Lump sum contract.ii) Item rate contract.iii) Percentage rate contract.		



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.1	(ii)	a) Cost plus percentage rate contract. b) Cost plus fixed fee contract. c) Cost plus variable fee contract. d) Cost plus variable percentage iv) Labour contract. v) Demolition contract vi) Fee contract. vii) Target contract. viii) Negotiated contract. ix) Material supply contract.	$\frac{1}{2}$ marks each (any eight)	4M
	(iii)	Describe percentage rate contract. State any one advantage and one disadvantage.		
	Ans :	<u>Percentage rate method :</u> In this method bill of quantities consist of description of item as per sanctioned estimate with their quantities, rates, unit and amount. Contractor is asked to quote only percentage above or below the rates shown in schedule. <u>Advantages :</u> <ol style="list-style-type: none"> 1) Suitable for private work 2) It allows extra items 3) Due to assurance of profit better quality of work is assured 4) Scrutiny of tender is simple 5) Overwriting and erasing of rates can be eliminated 6) Comparative statement can easily be prepared 7) No scope for contractor to submit unbalanced tender <u>Disadvantages :</u> <ol style="list-style-type: none"> 1) Final cost of work is not known till completion of work 2) Two or more contractors can quote same percentage which may increase trouble during allotment of tender 3) Uncertain rates can be quoted by contractor 4) Contractors can easily form ring 	2M 1 Mark each (any one)	4M
	(iv)	Enlist the tender documents.		
	Ans :	<u>List of tender documents :</u> <ol style="list-style-type: none"> 1. Title page : Regarding the agreement number 2. Index 3. Tender notice 4. General instructions 5. Special conditions 6. Form of contract 	4M	4M

Que. No.	Sub. Que.	Model Answers	Marks	Total Marks																						
Q.1	(iv)	7.Schedule 'A' – Showing details of materials to be supplied by department 8.Schedule 'B' – Bill of Quantities 9.Schedule 'C' - Detailed item wise specifications and drawings 10.Specifications : General and detailed 11. A complete set of drawings	1M ½ mark each (any four)	4M																						
	(v)	Describe schedule 'A'.																								
	Ans.	<u>Schedule 'A' :</u> It is a 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 are 'A' are- i) Description of material to be supplied ii) Approximate quantity iii) The rates at which the materials are to be charged iv) The place of delivery of material Schedule A <table><tr><th rowspan="2">Sr. No.</th><th rowspan="2">Particulars of materials</th><th rowspan="2">Approximate quantity</th><th colspan="2">Rates</th><th rowspan="2">Unit</th><th rowspan="2">Place of delivery</th></tr><tr><th>In Figure</th><th>In words</th></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> <div>Sign of contractorSignature of Owner/EE</div>			Sr. No.	Particulars of materials	Approximate quantity	Rates		Unit	Place of delivery	In Figure	In words													
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	b)	Attempt any <u>ONE</u> of the following:	2M																							
	(i)	Explain item rate method or unit price method and State any four advantages and disadvantages .																								
	Ans.	<u>Item rate contract :</u> In this contract contractors are required to quote rates for individual items of work on the basis of schedule of quantities supplied by the department. Rates of contractor for units of items include materials, Labour, overhead cost and profit. The schedule includes full description of items as per sanctioned estimate. This type of contract is suitable for work executed by Government, PWD and also suitable for buildings, roads, bridges.																								

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Q.1	b)	<u>Advantages of item rate contract:</u>	2M	6M
	(i)	<ol style="list-style-type: none"> 1. Quality of work is assured as there is no risk for contractor. 2. This contract allows extra items. 3. Contractor will be paid as per actual measurement thus method proves economical. 4. Variation in the quantities can be made during progress of work. 5. This contract is balanced as chances of excessive profit or loss is very less. 		
		<u>Disadvantages of item Contact:</u>	2M	
		<ol style="list-style-type: none"> 1. Total cost of work is not known till completion of work. 2. Contractor can submit unbalanced tender. 3. Both parties need to appoint large number of staff for taking measurement. 4. Classification of material results in to disputes between owner and contractor 		
	(ii)	Describe procedure of issuing materials through indent.	6M	6M
	Ans.	<u>Procedure of issuing materials through indent:</u> <ol style="list-style-type: none"> 1. Materials from the stock are issued on demand in a proper form no. 7 which is termed as Indent. It is prepared by Sub divisional Officer or Assistant Engineer. 2. Indent form is prepared in four copies. In all four copies entry of the quantity of the stores issued is made with the signature of store keeper. 3. Out of four copies, one copy is remained with the store keeper record, the second copy is returned to Indenting officer. Third and Fourth copies are being sent to Divisional officer. 		



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.2	a)	Attempt any <u>FOUR</u> of the following:		16M
	Ans.	<p>Explain administrative approval and technical sanction.</p> <p><u>Administrative approval:</u> For any work, it is necessary to take formal acceptance with respect to cost and work is called as administrative approval. For this the department sends a proposal to government for taking up the work. After considering all aspects like feasibility of project, financial aspect, government accepts proposal is called administrative approval.</p> <p><u>Technical sanction:</u> Technical sanction means the sanction of the detailed estimate, design, rates and cost of work. It is sanctioned by competent authority. The work is taken for the execution only after the technical sanction.</p> <p>If the estimated amount exceed 10% of administratively approved amount technical sanction is granted only after obtaining revised administrative approval for work technical sanction once given remains valid for 5 years.</p>	2M	4M
	b)	Prepare organisational structure of PWD.	2M	
	Ans.	<p><u>Organisation setup of PWD:</u></p> <pre> graph TD Project --> Labour Project --> Material Project --> Overheads Labour --> Engaged["Engaged by contractor"] Labour --> Departmental Departmental --> Work["Work changed staff"] Departmental --> Muster["Muster roll labour and casual labour"] Material --> Supplied["Supplied by contractor or supplier"] Material --> Manufactured["Manufactured by the department"] Overheads --> GE["G.E./A.C.E."] GE --> SE["S.E."] SE --> DOE["D.O.(E.E.)"] DOE --> SDO["S.D.O.(A.E.)"] SDO --> JE["J.E.(S.O.)"] </pre>	4M	4M



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Q.2	c)	State the requirements of valid contracts or essentials of valid contracts.	1 mark each (any four)	4M																			
	Ans.	Following are the requirements of valid contract: i. Contract should be in writing and should be signed by both the parties i.e. owner and contractor. ii. The subject matter of agreement must be legal and definite. iii. If situation arises the contract can be enforced in court of law. iv. Parties should be competent enough to carry out work. v. Both parties must give their free consent to do work. vi. Contract should be attested by responsible officer.																					
	d)	Differentiate between Lump sum contract and Item rate contract.	1 mark each (any four)	4M																			
	Ans.	<table><tr><th>Sr. No.</th><th>Item rate contract</th><th>Lump sum contract</th></tr><tr><td>i.</td><td>In this method contractor are required to quote rate for individual item of work on basic of schedule of quantities supplied to department.</td><td>In lump sum contract the complete work as per plan and specification is carried out by contractor for certain fixed amount as per agreement.</td></tr><tr><td>ii.</td><td>The payment to the contractor is made on the basis of detailed measurements of different items of work actually done by him.</td><td>After the completion of work, a fixed lump sum amount is paid to the contractor, and In large projects, part payments are made to the contractor at different stages of work on money agreed terms.</td></tr><tr><td>iii.</td><td>In this type of contract, there is no need for detailed drawings at the time of allotting contract. The detailed drawings can be prepared after the contract is awarded.</td><td>There is need of detailed drawing at the time of allotting contract</td></tr><tr><td>iv.</td><td>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.</td><td>This type of contract is suitable for small work.</td></tr><tr><td>v.</td><td>Applicable for all government works.</td><td>Comparative statement is not required.</td></tr><tr><td>vi.</td><td>Comparative statement is required.</td><td>Not applicable for government works.</td></tr></table>			Sr. No.	Item rate contract	Lump sum contract	i.	In this method contractor are required to quote rate for individual item of work on basic of schedule of quantities supplied to department.	In lump sum contract the complete work as per plan and specification is carried out by contractor for certain fixed amount as per agreement.	ii.	The payment to the contractor is made on the basis of detailed measurements of different items of work actually done by him.	After the completion of work, a fixed lump sum amount is paid to the contractor, and In large projects, part payments are made to the contractor at different stages of work on money agreed terms.	iii.	In this type of contract, there is no need for detailed drawings at the time of allotting contract. The detailed drawings can be prepared after the contract is awarded.	There is need of detailed drawing at the time of allotting contract	iv.	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.	This type of contract is suitable for small work.	v.	Applicable for all government works.	Comparative statement is not required.	vi.
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Q.2	e) Ans.	<p>Differentiate between running account bill and final bill.</p> <table><tr><th>Sr. No.</th><th>Running bill</th><th>Final bill</th></tr><tr><td>i.</td><td>The bill which is paid during the progress of the work for every month is called as running bill.</td><td>The bill paid after the completion of the work Is called as final bill.</td></tr><tr><td>ii.</td><td>In case of running bill, checking is not made thoroughly.</td><td>In final bill, checking is made strictly & thoroughly.</td></tr><tr><td>iii.</td><td>Running bill is paid within 10 days of submission.</td><td>Final bill is paid to the contractor within 90 days of issue of completion certificate.</td></tr><tr><td>iv.</td><td>Bill is based on running measurement.</td><td>Bill is based on second measurement.</td></tr><tr><td>v.</td><td>It is recoverable, if paid excess is binding.</td><td>Defect liability is binding.</td></tr></table>	Sr. No.	Running bill	Final bill	i.	The bill which is paid during the progress of the work for every month is called as running bill.	The bill paid after the completion of the work Is called as final bill.	ii.	In case of running bill, checking is not made thoroughly.	In final bill, checking is made strictly & thoroughly.	iii.	Running bill is paid within 10 days of submission.	Final bill is paid to the contractor within 90 days of issue of completion certificate.	iv.	Bill is based on running measurement.	Bill is based on second measurement.	v.	It is recoverable, if paid excess is binding.	Defect liability is binding.	1 mark each (any four)	4M
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f) Ans.	<p>Compare Imprest and temporary advance.</p> <p><u>Imprest :</u></p> <p>In P.W.D individual officer are given a permanent advance of Rs. 1000/- for the petty expenses to make a payment in connection with government work. From this amount they can pay transport charges, miscellaneous payment of materials and accounting of these works is known as imprest cash account.</p> <p>The record of transactions are to be prepared in duplicate_and originals transactions are sent to the higher authority for the purpose of sanctioning.</p> <p>It is granted without bills.</p> <p>Imprest account is rendered monthly or earlier when recoupment of sum is required.</p> <p><u>Temporary advance :</u></p> <p>In PWD, the amount which is advanced by disbursing officer to a subordinate officer so as to make the specific payment is known as temporary advance.</p> <p>Maximum amount of the temporary advance is usually upto Rs. 2500/-</p> <p>It is granted only on passed bills.</p> <p>Temporary advance is never recouped.</p> <p>The accounting of temporary advance is rendered with paid vouchers</p>	2M	4M																			
			2M																			



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks												
Q.3		Attempt any <u>FOUR</u> of the following:		16M												
	a)	Draft a tender notice for construction of ‘Ladies-hostel’ building at your polytechnic campus costing Rs 100 lakh. Assume any other suitable data if necessary.														
	Ans.	<p style="text-align: center;">Tender Notice</p> <p style="text-align: center;">Tender No: Date:14/11/2017</p> <p>Sealed item rate tenders are invited from by secretary, XYZ Institute of Class IV contractors registered with PWD for the work mentioned below:</p> <table><tr><th>Sr. No.</th><th>Name of work</th><th>Estimated cost</th><th>Earnest money</th><th>Security deposit</th><th>Time</th></tr><tr><td>1</td><td>Construction of Ladies Hostel</td><td>Rs. 100 Lakh</td><td>2,00,000/-</td><td>10,00,000/</td><td>24 months (including monsoon)</td></tr></table> <p>Blank tender form at non-refundable cost of Rs. 1000/- (Rs. 1100/- If required by post) can be obtained from the office secretary, XYZ Polytechnic, 10.00 a.m. to 5.00 p.m. during working hours of all working days (Except Sundays & Holidays) From 14/11/2017to 30/11/2017. Tenders will be received in office of secretary up to 3.00 pm. On 2/12/2017. & shall be opened on the same day at 4.00 p.m. in presence of contractors who may like to attend.</p> <p>The authorities reserve the right to reject any or all tenders without assigning any reason.</p> <p style="text-align: right;">Sd/- Secretary XYZ Polytechnic</p> <p>Note:- students may take different values for earnest money(1 % - 5 %), security deposit (5% - 10%) shall also be considered</p>	Sr. No.	Name of work	Estimated cost	Earnest money	Security deposit	Time	1	Construction of Ladies Hostel	Rs. 100 Lakh	2,00,000/-	10,00,000/	24 months (including monsoon)	1M	
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1	Construction of Ladies Hostel	Rs. 100 Lakh	2,00,000/-	10,00,000/	24 months (including monsoon)											
	b)	State the circumstances under which the lowest tender is rejected.														
	Ans.	<p><u>The following are the circumstances under which the lowest tender is rejected:</u></p> <p>1. When tender is not submitted in particular form sold by department.</p> <p>2. The lowest tenderer may lack in experience for work.</p> <p>3. Earnest money is not enclosed along with tender.</p> <p>4. Unsatisfactory reputation of lowest tender.</p> <p>5. In adequate finance to execute work.</p> <p>6. Inadequate connection of fair rates is not received.</p> <p>7. Tender is not signed by contractor.</p> <p>8. If any page is removed from document.</p> <p>9 If contractors is black listed by any department.</p>	1 mark each (any Four)	4M												



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.3	c) Ans.	<p>Describe the term security deposit.</p> <p><u>Security deposit:</u></p> <ol style="list-style-type: none"> 1. After acceptance of tender, contractor has to deposit a certain amount with the department or owner is called as security deposit. 2. It varies from 5 to 10% of total estimated cost of work. 3. If security deposit is not paid, then contract is not awarded and earnest money is forfeited. 4. If contractors fails to execute the work satisfactory, to maintain the progress, complete the work in time limit then security deposit is forfeited 5. After defect liability period the security deposit is refunded 	1 mark each (any Four)	4M
	d) Ans.	<p>State the classes of contractors along with capacity in terms of amount of the work to be executed.</p> <p>Depending upon technical capability and financial status contractors are classified as under :</p> <p><u>For general work</u></p> <p>Class I : No limit</p> <p>Class II : up to 750 lacks</p> <p>Class III : 300 lacks</p> <p>Class IV : 150 lakhs</p> <p>Class IV A : 90 lacks</p> <p>Class V : 50 lakhs</p> <p>Class V A : 30 lakhs</p> <p>Class VI : 15 lakhs</p> <p>Class VII : 7 lakhs</p> <p>(Note: Above limits may vary department to department)</p> <p>(Note: Students May Write This Also)</p> <p><u>For general work</u></p> <p>Class I : No limit</p> <p>Class II : up to 3 crore</p> <p>Class III : up to 1 crore</p> <p>Class IV : up to 50 lakhs</p> <p>Class V : up to 15 lakhs</p> <p>Class VI : up to 5 lakhs</p> <p>Class VII : up to 2 lakhs</p>	4M	4M



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.3	e)	Describe BOT project. State objectives of BOT project.	2M	4M
	Ans.	<u>B.O.T-</u> 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. <u>Objects of B.O.T.</u> 1. To encourage private investment. 2. To promote foreign investment, techniques and technology in country. 3. To release burden on public budget.		
Q.4	a)	Attempt any <u>THREE</u> of the following:	12M	12M
	(i)	State any four modes of payment to the contractor and describe any one. (Standard form of bills with its uses)		
	Ans.	Following are the modes of payment to the contractor – 1. Interim payment 2. Advance payment 3. Secured advance 4. On account payment 5. First and final payment 6. Retention money 7. Reduced rate payment 8. Final payment 9. Mobilization advance <u>Interim Payment:</u> 1. A partial payment given to the contractor monthly for works in progress or supply in progress under the terms of contract is called as interim payment. 2. Note that interim payment is not be considered as final acceptance of the work upto that level. Powers are given to the engineer to hold the interim payment under special circumstances. <u>Advance payment:</u> The payment made on a running account to a contractor for work done but not measured is called as advance payment. 1. Note that advance payment is not generally paid to the contractor, but under special case or under special circumstances, advance payment is issued to the contractor on the certificate of the assistant engineer who is the in-charge of the project work. 2. Note that the value of work done should not be less than the advance payment proposed to be made to the contractor.	½ Mark each (any four) <	



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.4	a) i)	<p><u>Secured advance</u></p> <p>An advance payment made to the contractor on the basis of the security of materials brought by the contractor to the site of work under construction is called as secured advance.</p> <p>1. Authority to make the secured advance is in the hand of Divisional Engineer up to the amount not exceeding 75% of the value of the materials brought to the site by contractor.</p> <p>Amount of secured advance is adjusted in the next running account bill within proportion to that of actual consumption of the materials</p> <p><u>On Account Payment :</u></p> <p>1. The payment made on running account to the contractor for the works done by him or supplies by him which is measured and recorded in measurement book (M.B) is called as 'on account payment'.</p> <p>2. This type of payment is made when only a part of the complete work or supply have been done and the work or supply is in progress.</p> <p>3. 10% amount is kept as deposit, out of which 5% amount is to be refunded at the end of the maintenance period. Note that percentage of amount may vary or change.</p> <p><u>Final Payment :</u></p> <p>The payment to be made within three month from the date of issue of certificate of final completion is called as final payment.</p> <p>After completion of works done by the contractor in all respects, the engineer prepare the final amount of work accurately after deducting all the previous payment made to the contractor.</p> <p><u>First and Final Payment :</u></p> <p>A single payment made for a small job or small work on its completion is called as "first and final payment".</p> <p>1. This type of payment is usually made or applicable for small work only. For example, construction of sanitary block for school building, component wall construction, septic tank construction, ornamental grill work, demolishing existing structure etc. are the examples of small work for which the first and final payment are made to the contractor.</p> <p><u>Retention Money :</u></p> <p>Some amount to be hold from the security deposit of contractor by the Engineer-in-charge, when there is any claim for the payment arises out of or under the contract against the contractor is called as "Retention Money".</p> <p>This amount is hold up till the finalization or adjustment of any claim is settled.</p>		

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Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.4	a) (i)	<p><u>Reduced Rate Payment :</u></p> <p>The payment which may grant by the engineer with the reduced rate when contractor completes an item or work not as per the specifications, drawings given in contracts terms and conditions is called as “Reduced Rate Payment”.</p> <p>The work or an item which is not done as per the specifications, drawings given in the prescribed terms of conditions of contract by the contractor, then in such case the engineer may pay the amount with reduced rate making the remark as the work is structurally sound.</p> <p><u>Mobilization Advance :</u></p> <p>Mobilization advance is the amount of money given to the contractor for establishment purpose.</p> <p>Establishment charges consists of the following work to be done on site under construction.</p> <ol style="list-style-type: none"> Approach roads Site office Go down for storage of building material Water tank Electric connection Other facilities which ensure the safety on projects and smooth working. 		
	(ii) Ans.	<p>Describe the two envelope system of submission of tender.</p> <p>The contractor is required to submit their tenders on or before the date and time mentioned by department / authority in sealed envelope.</p> <p>Tenders are submitted in envelopes marked as 1, 2 etc</p> <p>(1) Envelope 1:</p> <p>Envelope 1 contains -</p> <ol style="list-style-type: none"> earnest money deposit in the form indicated in the notice of invitation to tender. Income tax clearance certificate. Solvency certificate from bank. Certificate of registration as contractor. Details of technical personal as contractor. List of work of similar nature and magnitude carried out by tenderer. Details of plants and machinery available. Complete details of work in hand at the time of submission of Tender. Details about firm. Covering letter to tender. <p>(2) Envelope 2:</p> <p>This envelop contain the priced tender form</p>	2M	4M
			1M	



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks			
Q.4	(ii)	3) Envelope 3 : This envelop contains all above two envelopes and it is property sealed and endorsed on outside face tender for name of project.	1M	4M			
	(iii)	State the legal aspects of specification.	1 Mark each		4M		
	Ans.	<u>Legal aspects of the specification:</u> i. The tender documents and agreements towards legal aspect are incomplete and invalid without specifications. ii. Specifications have more legal strength and hence most of the contract state that in case of discrepancy between the drawings and specifications, the specification act as a legal proof. iii. The specification also mentions the mode of measurements, quality and procedure of item. So it is binding on both the parties to adhere to it. iv. The general character and the scope of the work is illustrated and defined by the specifications and signed by both the parties. So it becomes a legal binding.					
	(iv)	State the factors affecting valuation of building.				1 mark Each (any Four)	4M
	Ans.	The factors affecting valuation of a building are: 1) Forces of demand and supply 2) Cost of construction 3) Increase in population 4) Riots, war, flood and other natural calamities 5) Improvement of Public schemes 6) Interest on Banks 7) Cost of labour 8) Inflation 9) Monopoly of a property in market 10) Location of property 11) Returns from property 12) Life and age of building					
	b)	Attempt any <u>ONE</u> of the following:	1M	6M			
	(i)	Explain the Target contract with suitable example. state any two advantages and any two disadvantages of target contract					
	Ans.	<u>Target Contract-</u> In Target contract estimated cost is first calculated. Then contractor is paid profit on basis of percentage of saving of estimated cost. If cost of work exceeds estimated cost then there is provision of recovering loss amount from contractor.					

Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.4	b) (i)	<p><u>Example-</u> If the estimated cost of work is Rs 200000/- and target cost is Rs 175000/- then Gain Share occurs where the total costs and contractor's fee for the project are less than the adjusted target cost. Any saving or gain share is shared between the employer and contractor usually on a pre-agreed percentage basis. And Pain Share occurs where the total costs and contractor's fee for the project are greater than the adjusted target price. The pain share is usually shared between the employer and the contractor normally on a pre-agreed percentage basis.</p> <p><u>Advantages of Target Contract-</u></p> <ol style="list-style-type: none"> 1. Proper control on expenditure. 2. This contract is beneficial from owner point of view compare to other contract. 3. Risk and responsibility are clearly understood and known at time of award of contract <p><u>Disadvantages of Target Contract-</u></p> <ol style="list-style-type: none"> 1. Contractor must have high quality management. 2. More time consuming in procurement process. 3. Quality of work is not assured. 	<p>1M</p> <p>1 Mark each (any two)</p>	6M
	(ii) Ans.	<p>Describe nominal muster roll. With respect to its parts, method of recording attendance and unpaid wages if any.</p> <p><u>NMR:</u> The muster roll which is maintained to keep the record of works being done by a labour employed on each day is called as Nominal Muster Roll.</p> <ol style="list-style-type: none"> 1. There are two parts included in the muster roll i.e. part I and part II. 2. In Part I, there are columns and spaces kept to mention the name of workers, their designation, date of attendance or presence, rate of wages, total amount for each worker, or labour total amount for the whole signature of the person taking attendance, signature and date of the officer issuing payment. This part I is Nominal Muster Roll (N.M.R). 3. In part II, details of quantity of work being done by labour or workers and progress of work are kept recorded. 4. Unpaid payment should be entered in the muster roll and kept as deposit and such payments must be paid afterwards by hand receipts. 	<p>2M</p> <p>2M</p>	



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks																																																																																																																																																
Q.4	b) (ii)	<p><u>Format of NMR</u></p> <p style="text-align: center;">FORM – 21 : MUSTER ROLL</p> <p>Cash Book Voucher No. Date</p> <p>Name of work</p> <p style="text-align: center;">Part I – Nominal Roll</p> <table border="1"><thead><tr><th>Designation Description</th><th>No. (Sr. No.)</th><th>Name grouped according to classes</th><th>Father's Name</th><th>Dates .Month</th><th>Total</th><th>Rate Rs.P</th><th>Amount Rs.P.</th><th>Dated initial of paying officer</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td colspan="4">Daily Total</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td colspan="4">Initial of person marking daily attendance</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td colspan="4">Initial of Inspecting Officer</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td colspan="6">Passed for Rs. (Rupees) Signature</td><td colspan="3"></td></tr><tr><td colspan="6">Rank</td><td colspan="3"></td></tr><tr><td colspan="6">Grand total of this muster roll</td><td colspan="3"></td></tr><tr><td colspan="6">Deduct – Payment not made as per details transferred to Register of arrears</td><td colspan="3"></td></tr><tr><td colspan="6">Total amount paid in words Rupees</td><td colspan="3"></td></tr><tr><td colspan="6">Date Signature</td><td colspan="3"></td></tr><tr><td colspan="9">Part II – Details of measurement of work done by this labour employed as per this Nominal muster roll in cases in which the work is susceptible to measurement.</td></tr><tr><td colspan="3">Description of work (Grouped sub-headwise)</td><td colspan="3">Quantity</td><td colspan="3">Deduct as shown on the last muster roll</td></tr><tr><td colspan="9"></td></tr><tr><td colspan="9">Measurement of taken on (..... date) Signature Rank</td></tr><tr><td colspan="9">Measurement Book No. page Date</td></tr></tbody></table>	Designation Description	No. (Sr. No.)	Name grouped according to classes	Father's Name	Dates .Month	Total	Rate Rs.P	Amount Rs.P.	Dated initial of paying officer										Daily Total									Initial of person marking daily attendance									Initial of Inspecting Officer									Passed for Rs. (Rupees) Signature									Rank									Grand total of this muster roll									Deduct – Payment not made as per details transferred to Register of arrears									Total amount paid in words Rupees									Date Signature									Part II – Details of measurement of work done by this labour employed as per this Nominal muster roll in cases in which the work is susceptible to measurement.									Description of work (Grouped sub-headwise)			Quantity			Deduct as shown on the last muster roll												Measurement of taken on (..... date) Signature Rank									Measurement Book No. page Date									2M	6M
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Q.5	a) Ans.	<p>Attempt any <u>TWO</u> of the following:</p> <p>Describe any four terms related to tender documents .</p> <p>Following are the tender documents.</p> <p><u>1.Title page:</u> This is the first page of the document, giving the details about the name of work, contract agreement number, Estimated cost Put to tender etc.</p> <p><u>2. Index:</u> it shows the contents of the documents with their respective page numbers.</p> <p><u>3. Tender notice:</u> it is the notice inviting quotations/offers from the contractors. It is an important document. The tender notice shall include the following.</p> <p>i) Name of the authority inviting tender</p> <p>ii) Name of work and its location</p> <p>iii) Estimated cost</p> <p>iv) Time limit of completion</p> <p>v) Earnest money required along with tender</p> <p>vi) The availability of data and forms</p> <p>vii) The last date, place and time of receipt of tender</p> <p>viii) The right to reject the tender</p>		16M																																																																																																																																																



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.5	a)	<p>4. 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</p> <p>5. Schedule B : Schedule "B" consist of description of each item, approximate estimated quantity, rate per unit, the amount of each item and total amount of all the items. A contractor has to insert his rates on schedule "B" only.</p> <p>6. General instructions: These are the instructions which will guide the contractor in filling & completing the tender. The instructions also include care to be taken in filling the tender & mode of submission of the tender.</p> <p>7. Special conditions: These mainly depends on the nature of work, and include use of special construction materials, equipments, royalties to be paid, taxes & amenities for labours etc. A set of well prepared conditions of the contract are included about the rights and duties of the contractor, Engineerer & the department.</p> <p>8. Form of Contract: Usually printed forms are used. The language in the form is uniform. The PWD & other public bodies have the agreed forms like A₁, A₂, B₁, B₂ etc.</p> <p>A₁-For piece work - % rate A₂- For piece work –item rate B₁- % Rate tender for contracts original major & minor works B₂-Item rate tender for regular contracts original major & minor works</p> <p>9. Specifications: These are the clear & guidelines in the form of description of materials, labours to be used , method of execution of work & mode of measurements of work. The specifications may be</p> <p>a. Brief specification b. Detailed specification c. Standard specification</p> <p>10. Set of Drawings: These should include plans, sections & elevations. Working drawings & detailed drawings may be issued from time to time. These drawing are drawings are subjected to change and the contractor has to carry out the work as per the changed drawings.</p>	2 Mark each (any four)	8M



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.5	b)	<p>Find the value of a property consisting of land and building from the following data.</p> <p>Rent inclusive of all taxes Rs 4000 per month, outgoings 20% of gross rent. Net yield expected from the property 6%, future life of building 50 years.</p> <p>Ans.</p> <p>Monthly rent=4000</p> <p>Gross rent /income per annum = 12×4000 = 48000</p> <p>Outgoings = 20% of gross rent = $(20/100) \times 48000$ = 9600</p> <p>Net income = Annual gross income – outgoings = 48000-9600 = 38400</p> <p>Years purchase = $1/n$ = $1/0.06$ = 16.66</p> <p>Capitalized value = Value of the property = Net income \times Years purchase = 38400×16.66 = 639744</p> <p>Capitalized value = 640000/-</p>	<p>1M</p> <p>2M</p> <p>2M</p> <p>2M</p> <p>1M</p>	8M
	c)	<p>A building is newly constructed at the cost of Rs.600000 on a plot of 1000 m². Fix monthly rent of this property .Given:</p> <p>(i) Rate of land Rs. 100 per sq.m</p> <p>(ii)Return expected on cost of land and building = 8%</p> <p>(iii)Life of building 60 years, rate of interest for sinking fund= 3%,</p> <p>(iv)Scrap value = 10% of construction cost.</p> <p>(v)Other outgoings = 30% gross rent.</p> <p>Given : Cost of construction = 600000</p> <p>Cost of land @ Rs. 100 per sq.m (100X 1000) = 100,000</p> <p>Total cost = 600000 +100,000 = 700000</p> <p>Step 1 : To find total net return per annum :</p> <p>Return expected on cost of land and building 8% = $8/100 \times 700000$ =56000</p> <p>Total net return per annum = 56000</p> <p>Net cost of building = 600000-60000</p>	<p>1M</p> <p>2M</p>	



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.5	c)	$= 5,40000$ <p>Sinking Fund Installment for total cost of building</p> $= S \times I / ((1 + i)^n - 1)$ $= 540000 \times 0.03 / ((1 + 0.03)^{60} - 1)$ $= 3311.80$ <p>Step 2 : Other outgoings at 30% of Outgoings = 0.3 X R (Assuming gross rent as R)</p> <p>Gross rent = Net return + outgoings.</p> $R = 56000 + 3311.80 + (0.3R)$ $R = 0.3R + 59311.8$ $0.7 R = 59311.8$ $R = 84731.14$ <p>Step 3 : To find rent per month :</p> <p>Rent per month = $84731.14 / 12 = 7060.92$ Say 7065/-</p>	<p>1M</p> <p>1M</p> <p>2M</p> <p>1M</p>	8M
		<p>Q.6</p> <p>a)</p> <p>Ans.</p> <p>Specification of cement concrete for PCC work includes-</p> <p>(i) Materials :</p> <p>(a) Course aggregate :</p> <p>Coarse aggregate shall be from hard broken stone of compact basalt or granite or similar stone and shall be free from dust, dirt, oil and other foreign matters.</p> <p>Size of stone shall be 20 mm and down and all sizes of stones shall be retained in a 5 mm square mesh and well graded.</p> <p>Size of stone aggregate depends upon the thickness of concrete and nature of work.</p> <p>b) Fine aggregate :</p> <p>Fine aggregate shall have coarse sand consisting of hard, sharp and angular grains.</p> <p>Sand shall be as per the standard specification.</p> <p>Sand shall be clean and free from dust, dirt, oil and other organic matter.</p> <p>c) Cement :</p> <p>Cement shall be fresh, not old & as per the standard I.S. specification and shall have required compressive strength and fineness.</p>	<p>16M</p> <p>1/2 Mark each</p> <p>4M</p>	



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.6	a)	<p>(d) Water :</p> <p>Water shall be clean water, free from any impurities and free from alkaline and acid matters; water shall be suitable for drinking purpose.</p> <p>ii) Reinforcement: It shall be of mild steel free from corrosion .All bars shall be made and placed as per bar schedule & design. Proper overlapping shall be provided.</p> <p>iii) Proportion :</p> <p>The proportion of concrete shall be such that it should give strength of at least 20 N/mm² .1: 1.5:3 proportion of cement, sand and coarse aggregate by volume shall be used, unless otherwise specified.</p> <p>All ingredients shall be dry. Bulking of sand allowance shall be made for wet sand.</p> <p>iv) Mixing of concrete</p> <p>a)Machine Mixing :</p> <p>Cement, sand and coarse aggregate shall be taken into the mixer in Required proportion.</p> <p>The mixing time shall not be less than 3 minutes</p> <p>Mixed concrete shall be discharge on a masonry platform or on a Flat iron sheet.</p> <p>b)Hand Mixing :</p> <p>Hand mixing is allowed for small work only. Mixing of ingredients shall be done on masonry platform or flat iron sheet.</p> <p>Then water shall be added slowly and gradually and then turning the mix up and down at least three times by spade till to obtain a plastic mix of the required workability and water – cement ratio.</p> <p>v) Form work/Centering :</p> <p>Form work and centering shall be used as per the standard specifications Internal surface of formwork shall be applied by oil so as to avoid sticking of concrete during removal of the formwork.</p> <p>vi) Laying of concrete :</p> <p>Concrete shall be laid gently and compacted with rods & tamping with wooden tampers or with mechanical vibrating machine until a dense concrete is obtained.</p> <p>Immersion type vibrators or needle vibrators shall be used for thick concrete or mass concrete. Surface vibrators or form vibrators shall be used for thin concrete. There shall not be over – vibration.</p> <p>Concrete shall be laid continuously.</p> <p>(vii) Curing :</p> <p>When concrete is on the point of hardening, after and about two hours laying, then it shall be kept wet by covering with wet gunny bags for 24 hours and then cured by flooding with water. Making mud wall 75 mm high or by covering with wet sand continuously for 15 days</p>		



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.6	a)	<p>(viii) Measurement :</p> <p>The measurement shall be taken as per the drawing or as per instruction of the engineer. The measurement shall be in cubic meter without deducting volume of steel. The rate of RCC shall be for the complete item which include shuttering ,tools & plants .The measurement shall confirm IS 1200</p>	<p>$\frac{1}{2}$ Mark Each</p>	4M
	b) Ans.	<p>State and describe the types of specifications.</p> <p>Following are the various types of specification:</p> <p>a. Brief specification</p> <p>b. Detailed specification</p> <p>c. Standard specification</p> <p>d. Manufacturers specification</p> <p>(a) 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.</p> <p>(b) 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.</p> <p>(c) 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.</p> <p>(d) Manufacturers specifications: This type of specifications in which the properties of products such as strength, thickness, depth, elasticity, chemical composition etc. are mentioned</p>	2 M	
	c) Ans.	<p>Explain sinking fund method of depreciation.</p> <p>Sinking fund method: In this method, the depreciation of the property is assumed to be equal to the annual sinking fund plus the interest on the fund for that year, which is supposed to be invested on interest being investment.</p> <p>This method is based on a well established principle of compound interest, however this method do consider the consumption of usefulness of the property.</p> <p>Sinking Fund Installment = $S \times i / ((1 + i)^n - 1)$</p>	<p>3M</p> <p>1M</p>	4M

Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.6	d) Ans.	<p>Define outgoings. State various types of outgoings.</p> <p><u>Out goings:</u> The expenditure or expenses which are to be incurred in connection with the property, to maintain revenue from it is called as out goings.</p> <p>These are generally assumed to be 30% of the gross income.</p> <p><u>Various types of outgoings:</u></p> <p>1. Municipal taxes: These are paid to the local authorities for the services like water supply, sanitation etc. These taxes are calculated at certain percentage of rentable value of the property.</p> <p>2. Repairs: it is the amount spent for annual repair and maintenance to keep property in fit condition. This amount is usually 1 to 1.5% of the total value of the property.</p> <p>3. Sinking Fund: The fund created by regular periodic payment which accumulates at the compound interest is called a sinking fund. This amount is used for reconstructions of the building at the end of utility period.</p> <p>4. Management & collection charges: These are the charges which include expenses on rent collector, chowkidar, sweeper etc. These may be 5 to 10 % of the gross rent.</p> <p>5. Insurance: It is the premium paid by the owner of the property. It depends upon the sum assured.</p>	1M	4M
	e) Ans.	<p>Define valuation. State necessity of valuation.</p> <p>Valuation- Valuation is a branch of quantity surveying which deals with the art of assessing the present fair value of a property.</p> <p>Valuation of a property such as a land, building, factory etc. is necessary for the following purposes.</p> <p><u>Necessity:</u></p> <p>The various necessities of valuation are as follows:</p> <ol style="list-style-type: none">1. Buying and selling the property.2. Taxation.3. Rent fixation.4. Security of loans or mortgage.5. Compulsory acquisition.6. Insurance.7. Wealth tax and estate duty.8. Assessment of stamp fees.9. Gift tax.10. Partition.	1M 	



Que. No.	Sub. Que.	Model Answers	Marks	Total Marks
Q.6	f)	State the necessity & importance of specification of an item of work.		
	Ans.	<p>Necessity:</p> <ol style="list-style-type: none">1. To give the required information for an item of work.2. To help the contractor in giving necessary quotation for work.3. To carry out supervision work effectively during construction.4. For necessary execution of the work.5. It protects the owner from any damage due to bad workmanship or low quality of material.6. Witness in the court to settle the disputes.7. To avoid extra items. <p>Importance of specification:</p> <ol style="list-style-type: none">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 papers without specification are incomplete and invalid	<p>1 Mark each (any two)</p> <p>1 Mark each (any two)</p>	4M