DIPLOMAEXAMINATIONINENGINEERING/TECHNOLOGY /MANAGEMENT/COMMERCIALPRACTICE, APRIL– 2025

CIVIL EENGINEERING

Construction management and safety engineering-ANSWER KEY

PART-A

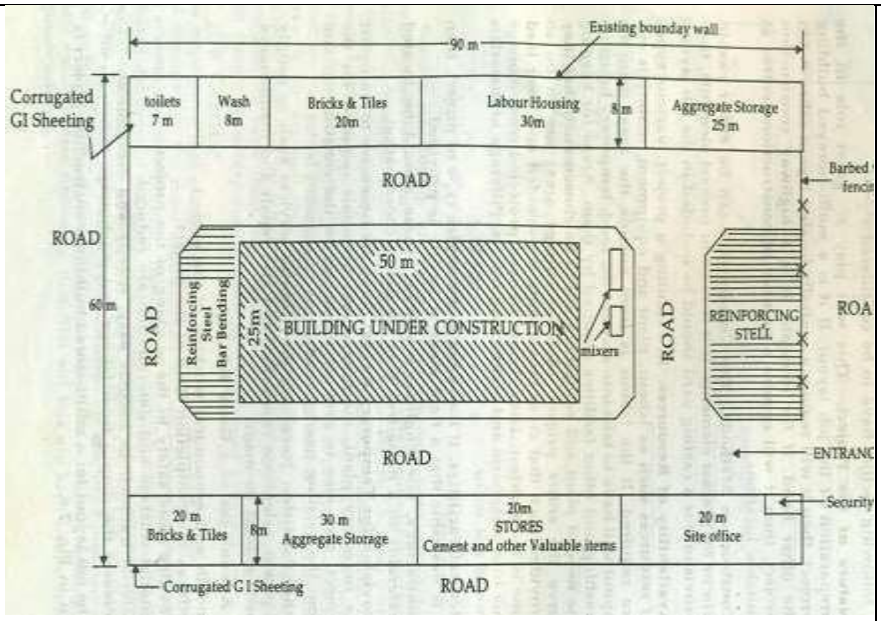
. (9x1=9Marks)

1.	The person who owns the project and has full authority to control the whole project	1	1
2.	DETAILED PROJECT REPORT	1	1
3.	Critical path method process.	1	1
4.	Free Floats	.5X2	1
5.	BIM stands for **Building Information Modeling** and is a workflow	1	1
6.	The Payment of Wages Act, 1936, The Minimum Wages Act, 1948	.5X2	1
7.	Check working condition of equipment. Monitor air supply regularly during the entire dive.	1	1
8.	Angle Dozers work best handling broken and granular materials, soils, and gravel.	.5X2	1
9.	A security deposit is money that is given to a landlord, lender, or seller of a home or apartment as proof of intent to move in and care for the domicile.	1	1

PART-B

(8x3=24Marks)

1.	• Simplest type of organization • The responsibility distributed from top to bottom. • Responsibilities at all levels are definite and fixed. • It is simple to work and easily understood by the employees. Facilitates quick decision making and responsibility for any mistakes can be easily fixed.	1x3	3
2.	A **builder** is a person whose job is to build or repair houses and other buildings. **A designer** is an organisation or individual whose business involves preparing or modifying designs for construction projects, or arranging for, or instructing, others to do this. **An Architect** is a professional who transforms building designs into reality, ensuring functionality, safety, and creative vision.	3	3

3.		3	3
4.	• The control of inventory is a two-step decision process. Two • questions need to be asked: • How much to buy: The decision will be based on the • costs involved • When to buy: Whether to buy now or to wait. • Tells us "How much to purchase" • One of the techniques of Inventory that minimizes total • holding costs and ordering costs for the year • ¨Solves the problems of a material manager	3	3
5.	A project's critical activities are those that have zero float, meaning any delay in completion delays the entire project. In contrast, the critical path maps the longest path through all critical activities from start to finish in a project.	1.5x2	3
6.	The tenders should be in the prescribed form which can be downloaded from site www.etenders.kerala.gov.in. The tender fee should be submitted online. The tender form without prescribed tender fee will be summarily rejected. The cost of tender forms once paid will not be refunded. **I.** There are **6** files which are mandatory for uploading a tender. 1. Notice inviting tender (NIT) - PDF format. 2. Tender document –PDF format. 3. Agreement form – PDF format. 4. E_payment form – PDF format. 5. Bill of quantity (BOQ) – Excel format. E-tender data sheet – Word /PDF format	3	3
7.	bull dozer, angle dozer, excavator, power shovel, forklift, tower crane	3	3

8.	Item rate contract: A contract in which a contractor carries out the work as per the drawings, BOQs, and specifications for a payment made entirely on measurements taken as the work proceeds. Percentage rate contract: Refers to a type of item rate contract. In a percentage rate contract, all the sanctioned items are drawn up according to their descriptions with amounts, quantities, rates, and units as shown in the estimate.	1.5x2	3

9.	• Loss of human life • Temporary or permanent injuries to workers. • Loss or damage of materials and equipments. • Loss of time in completion as work. • Loss due to workmen compensation insurance and cost involved is redoing the work.	3	3
10.	• Planning defect and effects in designing. • Unsuitable time limits. • Selecting incompetent contractors. • Defective supervision of work. • No coordination between different trades. • Unskilled or untrained operatives. • In adequate instruction from supervisor regarding the work. • Lake of suitable equipment. • Defect in equipment and machinery. • Lake of safety devices in using machines and equipment.	3	3

PART-C

(6x7=42Marks)

III.	advantages • Discipline problems are solved by line authority. • It provides more job opportunities. • It gives increased economy and efficiency, though extra expenditure has to be incurred on staff experts. disadvantages • Possibilities of conflict between line staff and functional staff are there as the responsibilities and authority are not well defined. • The over head cost of the product will increase due to high salaries of staff personnel.	7	7
IV.	**OR** **Nature of the project :** Describes the type of project **Construction methods :** Construction can be either cast in-situ or by precast elements. If it is to be of precast elements, then provision for casting yard should be included in the job layout. **Availability of resources :** Various types of resources are used in executing a project such as labor, plant and equipment material etc. **Medical Facilities:** If it is a big and complex type of project then it is desirable that a field medical facility is provided. **Contractors and Site engineer's offices:** These should be located preferably in a noise free area for better co-ordination. **Provision for temporary roads.** **Other facilities** *Services such as supply of power *water *telephone connection and also repair and maintenance yards should be made.	2x3.5	7

V.	• *Salient features of bar chart:* • The chart is simple to prepare and interpret. • Each item of work is shown separately. • Modification to chart as on required can be carried out easily. • ***Limitations of bar chart:*** • The sequence of activities is not clearly defined. • The various activities are inter dependent. • Non control on progress of work. • The chart is only suitable for small and simple jobs. • uncertainties	7	7
VI.	**OR** VED Analysis: VED stands for **Vital, Essential and Desirable**. Materials are classified based on their criticality in terms of their effect on various construction activities *ESSENTIAL items are those without which the company may have to face risks. However, essential items will have to be provided or replaced by the industry within a timeline. Vital (V): These are essential materials whose non-availability while putting a halt to business operation. • These materials need to be in stock at all times else	2+2+3	7
VII.	a) A lump sum contract, sometimes called stipulated sum, is **the most basic form of agreement between a contractor and a customer**. A lump sum contract or a stipulated sum contract will require that the contractor agree to provide specified services for a stipulated or fixed price. b) An agreement between two parties: one party, the employee, agrees to work for the other party, the employer, for a weekly number of hours in return for a wage. **OR**	7	7
VIII.	Suitability for Job Conditions: The Equipment must meet the requirement of the work, climate and working conditions. Size of Equipment Past Performance Operating Requirements Reliability of Equipment Economical Aspects Service Support Use in Future Projects	7	7

IX	• Every large construction project such as big apartment construction or dam construction should have a safety department headed by an officer. • It is necessary to include the safety measures as a clause in the contract document. • Previous safety record of a contractor is an important consideration in the pre qualifications of contractor. • Safety is a cost item and no worth while programme can be developed without providing finds for it. • Safety measures should start at the planning and designing.	7	7
X.	**OR** Excavation • By not providing support for the side ever for the shallow trenches it causes many accident. • The side of trenches should be supported by batters held in position by cross members. • Excavation areas shall be adequately lighted for night work. • Excavations shall have at least one ladder per 15 m of length in case of hazardous work and per 30 m of length in case of less hazardous works. Working at Heights • Use the Proper Equipment for Working at Heights (Scaffold, Lift, Ladder) • Safely working at height requires proper training, focus, and the right safety precautions to be in place. • Use Railing • Workers should wear safety harnesses when working on scaffolding, especially when working at heights greater than 1.8 meters.	2x3.5	7
XI.	• It is one of the best and popular techniques of inventory control. • Divides materials in to three catogories. • A, B, C- according to value. Class A:	7	7

	• Low value (5-10%), high quantity (50-60%)These items have 70 to 80% of purchase value but less in quantity about 10 to 20%. • The capital should not be blocked in these items. • They can be ordered frequently and consumed immediately. • They require special attention in stores. • Monitored by top management • Rigid estimate of requirements B They have about 15 to 20% purchase value and 20 to 30% quantity to purchase. • Medium valued items therefore large inventory of them is not necessary. • They can be ordered frequently but at the same time the quantity ordered should be such that it will be economic to purchase and its shortage should not be there. • They are less valued than A items • Managed by middle level of management C • They have the least purchase cost about 5 to10%. • They are required in large quantity about 50 to 60%. • They can be purchased in bulk to avail large discounts and fewer prices to pay. • This will also reduce the cost of ordering and purchasing. • They can be purchased once or twice in a year. They are least-valued items		
XII.	**OR** There are various methods involved for inventory control but two are commonly used: **Always, better and control (ABC) and vital, essential and desirable (VED)**. ABC analysis helps in identifying the items that require the greater attention for control. In this, 10% items	7	7

	consume about 70% of the budget (Group A). • A, B, C- according to value. • V, E, D- according to Criticality • VED Analysis: VED stands for **Vital, Essential and Desirable**. Materials are classified based on their criticality in terms of their effect on various construction activities		
XIII.	• It helps in doing work as per specification. • The entire work is divided on the basis of functional specialization and hence the efficiency will be increased. • The work will be completed with better quality due to the services of functional specialists. • The worker will receive too many instructions simultaneously. • It is difficult to fix responsibility. • This system is too complicated. **OR** **Dummy activity** is a hypothetical activity which requires zero time and zero resources for completion. Dummy arrow represents an activity with zero duration.	2x3.5	7
XIV.	• An **activity** is a part of the project denoted by an arrow on the network. • The tail of the arrow indicates the start of the activity whereas the head indicates the end of the activity. One and only one arrow is used to represent one activity of given duration **Event** • Instant in time when certain activity has been started or completed • It is represented by a circle The beginning of an activity is a tail event and completion of an activity is the end event ,	7	7

	production will be affected.		