



- Systematic arrangement of calculations, neat drawings and clear answers are essential.
- Any data not given can be reasonably assumed. The exam consists of five questions.
- All of them must be answered. All dimensions in meter.

(Only Course Notes are allowed)

Answer the following questions

Question (1) Choose the right answer from the following

(20 marks)

- 1- Construction equipments may include the following:
 - a) Loader, bulldozer, grader and telescopic cranes
 - b) Loader, airplanes, grader and Cranes
 - c) Loader, pilling machines, slip form and tunnel form
 - d) Motor grader, scraper, bulldozer and concrete mixer
 - e) All of the above
 - f) None of the above
- 2- Modern construction systems technologies may include:
 - a) Bearing walls, slip form, tunnel form and lift slab
 - b) Skeleton systems, slip form, tunnel form and lift slab
 - c) Slip form, tunnel form, push up, lift slab and combined system
 - d) Tunnel form, slip form, push up, lift slab and precast system
 - e) All of the above
 - f) None of the above
- 3- pilling machines can do the following:
 - a) Removal of earth work
 - b) Cutting rocks
 - c) Boring of piles or hammering of piles
 - d) Casting concrete on the pile borings
 - e) All of the above
 - f) None of the above
- 4- Scraper is a very useful machine in the following :
 - a) Earth cut and fill
 - b) Concrete casting
 - c) Lift slab process
 - d) Tunnel form process
 - e) All of the above
 - f) None of the above
- 5- Roller compacted machine can be used in:
 - a) Compacting road earth works
 - b) Compacting asphalt
 - c) Compacting concrete
 - d) Compacting all road works
 - e) All of the above
 - f) None of the above

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Subject: Construction Engineering
Code: *****
Year : Diploma (Level 500)
Time Allowed : 3 hours
Total Marks : 100 marks

- 6- Lift slab systems may include the following advantages:
- a) Low cost
 - b) Cheaper Labor
 - c) Faster than other techniques
 - d) Man over on arch design
 - e) All of the above
 - f) None of the above
- 7- Push up systems may have the following disadvantages:
- a) Low cast
 - b) High cast
 - c) Low productivity
 - d) Well trained workers
 - e) All of the above
 - f) None of the above
- 8- Form works can be manufactured from:
- a) Wood, steel, aluminum and any cast able materials
 - b) Wood only
 - c) Steel and aluminum only
 - d) GRC only
 - e) Fiber glass and carbon fiber only
 - f) All of the above
 - g) None of the above
- 9- Responsibilities of construction engineer may include:
- a) Life cycle cost analysis
 - b) Value engineering techniques
 - c) Supervision
 - d) Bill of quantities
 - e) All of the above
 - f) None of the above
- 10- The main mechanical properties that must be founded in wooden form works is or are:
- a) Shear strength
 - b) Bending strength
 - c) Bearing strength
 - d) Compressive strength
 - e) Friction strength
 - f) All of the above
 - g) None of the above



Question (2) Choose the true or false statement from the following

(10 marks)

No.	Question	True	False
1-	Constructability is the ability of the system to be constructed any how any where		
2-	Productivity is the output of any machine equipment, system, device in a unit time		
3-	Slip form systems is suitable on hot weathering conditions without any curing precautions for casting concrete		
4-	Wooden form work are preferable in all tall building owing to their durability		
5-	Folowability of concrete mix is the main item in all new construction projects using new construction methodology		
6-	Optimum productivity means the best output of a machine in the optimum time		
7-	Method of statements means the way or ways and logical sequences on which the activity can be constructed achieving economically, quality and sustainability		
8-	Sustainability means the ability of the facility to withstand against any load, weather and service conditions		
9-	Lump sum projects means one amount of money to all the activities and may Favorite on the design and build projects		
10-	Tunnel form is the best construction technology systems for building in earthquake zones		

Question (3)

(20 marks)

- 1- State briefly the differences between codes, state of the art, specifications and general rules in construction process?
- 2- Use free hand sketches show the components of wooden form work and show the function of each element?
- 3- What are constrains on push up system and lift slab system?
- 4- What are the advantages of both slip form and tunnel form systems?
- 5- What are the ideas of combined system show your answer with simple graphs?

Question (4)

(20 marks)

- 1- Mention the different causes of form work collapse?
- 2- Compare between quality, safety and economy from construction point of view?
- 3- Give five examples for using temporary structures form work and their uses for concrete structures?
- 4- Mention five types of special concretes and show their uses and field of application?
- 5- Draw the work shop plane for construction projects from conception phase up to hand over showing all related, dependent and in dependent relationships between all activities?
- 6- State briefly the relationships between quality control, quality assurance and total quality management?
- 7- Mention five different construction equipments that are used in a construction projects showing their uses application and show graphically their components?
- 8- What is meant by lurching trusses – sheeps foot roller – crawler crane – jack hammer – super structure – infra structure?
- 9- What is meant by Submittals- Limited bid – negotiation bid?
- 10- What is meant by (design and build) construction contract?

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Question (5)

(30 marks)

- An embankment cross section is shown in the figure (1), the soil in the embankment has to be compacted, the borrowed soil will be brought in a 10 cubic meter truck. The borrowed site soil has 15% swelling factor and specific gravities, $G_s = 2.67$.

- What will be the number of trucks for 1000 m length of embankment construction?
- If the embankment was covered and protected with key stone blocks (12 unit/m^2) what will be the total number of key stone blocks?
- If the borrowed soil comes from 30 km away from the embankment what will be the optimum number of the trucks to finish the process in 100 days?

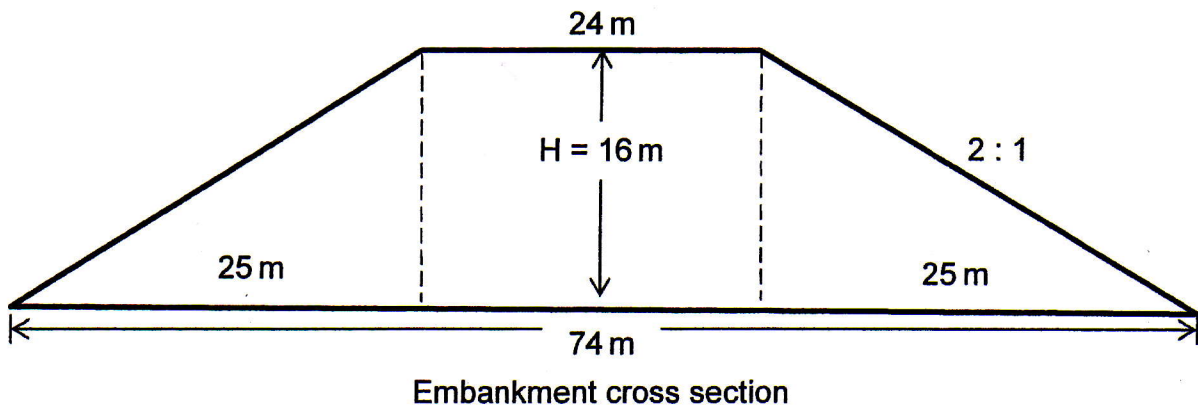


Figure (1)

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