CST– Construction Technology and R.C.C

**T017**

**Friday, 24/11/2017**

**08:30 – 11:30 AM**

WORKFORCE DEVELOPMENT AUTHORITY

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# ADVANCED LEVEL NATIONAL EXAMINATIONS, 2017, TECHNICAL AND PROFESSIONAL STUDIES

**EXAM TITLE: CONSTRUCTION TECHNOLOGY AND R.C.C**

**OPTION: Construction (CST)**

**DURATION: 3 hours**

## INSTRUCTIONS:

The paper is composed of **three (3) main Sections** as follows:

| | |
|---|---|
| **Section I: Nineteen (19) compulsory** questions. | **55 marks** |
| **Section II**: Attempt **any three (3)** out of five questions. | **30 marks** |
| **Section III**: Attempt **any one (1)** out of three questions. | **15 marks** |

The use of calculator is allowed

**Note:**

***Every candidate is required to carefully comply with the above instructions. Penalty measures will be applied on their strict consideration.***

**Section I. Nineteen (19) Compulsory questions** **55 marks**

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**01.** What is the importance of foundation in construction? **4 marks**

**02.** Classify mortar according to the binding material used. **4 marks**

**03.** What do you understand by batching? **1 mark**

**04.** In which condition the mat foundation may be adapted. **3 marks**

**05.** What do you understand by the following terms used in building construction technology?
(i) A retaining wall; (ii) A lintel; (iii) Intrados. **3 marks**

**06.** Give three factors that the selection of type of roof will depend upon? **3 marks**

**07.** What do understand by bearing capacity of the soil? **3 marks**

**08.** Differentiate substructure to the superstructure. **2 marks**

**09.** What are the steps involved for the setting out of the building? **4 marks**

**10.** What is the purpose of lintel on the building? **3 marks**

**11.** Where a lintel is it located? **1 mark**

**12.** Calculate the height of king post if its tie beam is 10m and the slope is 60%? **3 marks**

**13.** What do you mean by a partition wall? **2 marks**

**14.** What is the difference between wall and fence? **2 marks**

**15.** What is the purpose of using the reinforced steel in concrete? **3 marks**

**16.** Describe five common mistakes which affect the quality of concrete. **3 marks**

**17.** What are the functions of admixtures in concrete? **3 marks**

**18.** A metal rod of cross-section 15.7mm x 20mm and of length 1m extends 0.1mm under an axial pull of 6,280N. Calculate the stress and strain under this condition? **4 marks**

**19.** Discuss on how the cement is manufactured? **4 marks**

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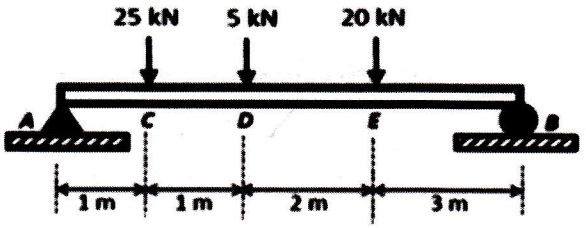
**Section II. Choose and answer any three (3) questions.** **30 marks**

**20.** Discuss the conducts that are required while working on scaffold.

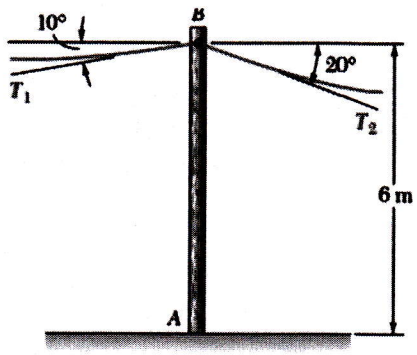
**10 marks**

**21.** Calculate the shear force and bending moment for the beam subjected to the loads as shown in the figure below, then draw the shear force diagram (SFD) and bending moment diagram (BMD).




**10 marks**

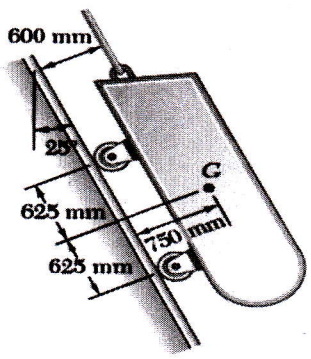
**22.** A 6m telephone pole of 1600N is used to support the wires. Wires $T_1$=600N and $T_2$=375N. Determine the reaction at the fixed end A.




**10 marks**

**23.** Mention at least ten purposes of ground investigation. **10 marks**

**24.** A loading car is at rest on an inclined track. The gross weight of the car and its load is 25 KN, and it is applied at G. The car is held in position by the cable. Determine the tension in the cable and the reaction at each pair of wheels. **10 marks**



**Section III. Choose and answer any one (1) question.** **15 marks**

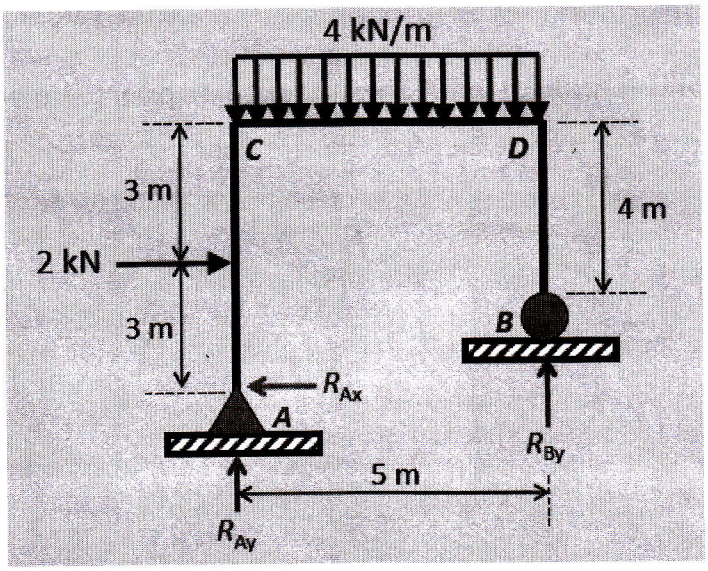
**25.** In relation to concrete construction, discuss the defects below in concrete. After a clarification of the defects; describe clearly their causes, prevention and remedies.

**a)** Colour variation

**b)** Crazing

**c)** Rain damage

**26.** After calculation of the shear force and bending moment for the frame subjected to the loads as shown in the figure below, draw the shear force diagram (SFD) and bending moment diagram (BMD).




**27.** Determine the force in each member of the loaded truss by Method of Joints.