



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2016/2017**

COURSE NAME : TEMPORARY WORKS
CONSTRUCTION

COURSE CODE : BNC40203 / BNC 31603

PROGRAMME : BNC

EXAMINATION DATE : JUNE 2017

DURATION : 3 HOURS

INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES

Q1 (a) In temporary works construction,

(i) Differentiate the formwork and falsework.

(2 marks)

(ii) With the aid of sketch, show the parts of elements of formwork and falsework in construction of deep foundation (driven pile + pile cap and tied beam).

(3 marks)

(b) The following **Table 1(b)** of material properties and information to be used for temporary works,

Table 1(b)

1. Timber wood, meranti light red	
Allowable stiffness	9.86 GPa
Allowable flexural strength	9.17 MPa
Allowable shear strength	0.66 Mpa
Allowable parallel compression strength	6 Mpa
2. Buckling	
$P = (\sigma_{\text{parallel}}) \times C_p \times A$	assume $C_p = 0.5$
3. Pouring concrete	
$P_m = C_w C_c [150 + 9000 R/T]$	
4. Bolt	
Diameter 22.2 mm $N = 1.24 \text{ kN}$	Diameter 12.7 mm : $N = 0.79 \text{ kN}$
5. Steel grade, G-30	
Size : Square 100 x 100 mm ; thickness = 5 mm.	
Allowable strength due to shear	$0.37 \sigma_y$
Allowable strength due to tensile	$0.60 \sigma_y$
Allowable strength due to flexural	$0.66 \sigma_y$
Allowable strength due to compression	$0.60 \sigma_y$
Stiffness	$E = 2.1 \times 10^8 \text{ kPa}$

- (i) The 3 m span of bridge for temporary work was made by using 2 pair of square steel 100 x100 mm with thickness = 5 mm. Determine how much live load can be imposed to this bridge.
(10 marks)
- (ii) Determine the numbers of wood beam (80x120 mm) if same load is allow to this temporary wooden bridge.
(5 marks)
- Q2** (a) Explain **FOUR (4)** methods to solve and protect trenching works.
(4 marks)
- (b) Explain the **FIVE (5)** Common Causes of Cave-ins
(5 marks)
- (c) Describe **FOUR (4)** type of visual field manual test to trenched soil
(4 marks)
- (d) With the aids of sketch, Set up the construction method to protect trenching to lay 1 m diameter concrete pipe in 3 m depth of excavated soil by braced cut structure, elaboration should be with 5 m (material, machinery, method, man, money).
(7 marks)
- Q3** (a) List down **THREE (3)** types of crane normally used in construction industry.
(3 marks)
- (b) State the elements of *h o i s t s a f* and *e* in key word **hoist safe** in safe operation of hoisting practices.
(6 marks)
- (c) State **FIVE (5)** safe rigging practice.
(5 marks)
- (d) The mobile crane to do hoisting work for construction of building will operate in the area of soft soil, analyze **TWO (2)** special precautions in this conditions.
(6 marks)
- Q4** (a) Explain the construction sequence of Pyllar of bridge using cellular cofferdam
(5 marks)
- (b) (i) Discuss the problems usually faced in under water concreting
(5 marks)

- (ii) To overcome the above problems, explain **TWO (2)** requirements in underwater concreting. (5 marks)
- (c) Evaluate the effectiveness of tremie method compare to bucket placing in under water concreting (5 marks)
- Q5** (a) List down **FIVE (5)** types of scaffolding. (5 marks)
- (b) Compare the terminology of : *temporary work, form work, false work, shoring, And scaffolding* (5 marks)
- (c) The load to strut / bracing (Length = 6 m) of braced cut consist of axial compression load of 300 kN and bending moment from it's own weight of steel 78 kN/m³ and live load of 50 kg/m. The yield strength of steel is 430 Mpa, design the size of this shtrut using square hollow steel profile.
(Note : Parameters of square hollow section should be calculated , take wall thickness = 5 % of width). (10 marks)

-END OF QUESTIONS-

FINAL EXAMINATION

SEMESTER / SESSION : SEM II / 2016/2017

PROGRAMME CODE : BNC

COURSE NAME : TEMPORARY WORKS CONSTRUCTION

COURSE CODE : BNC40203/BNC31603

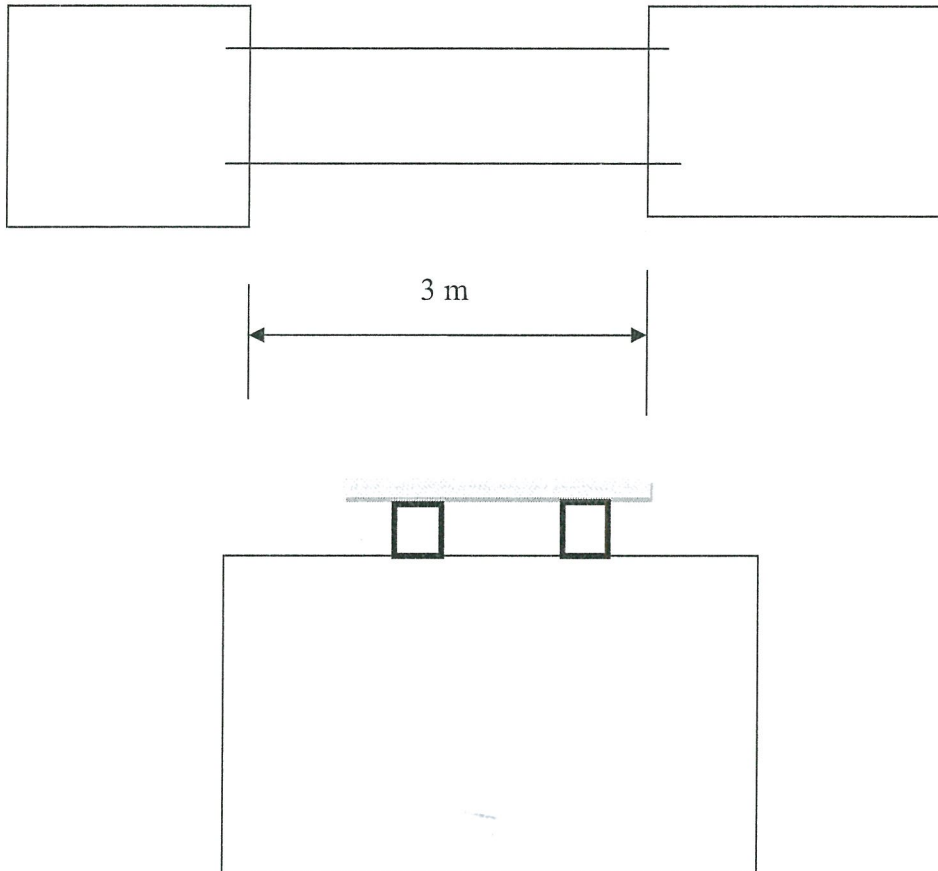


Figure Q1(b)

FINAL EXAMINATION

SEMESTER / SESSION : SEM II / 2016/2017

PROGRAMME CODE : BNC

COURSE NAME

: TEMPORARY WORKS CONSTRUCTION

COURSE CODE : BNC40203/BNC31603

List of Formula :

$$N = \chi A f_y ; \chi = 1 / \{ \phi + (\phi^2 - \lambda'^2)^{0.5} \} ; \phi = 0.5 \{ 1 + 0.49 (\lambda' - 2) + \lambda'^2 \} ; \lambda' = \lambda / (\pi^2 E / f_y)^{0.5}$$

$$\lambda = L_E / r ; r = (I/A)^{0.5}$$

Conversion unit :

$$1 \text{ kg} = 2.2 \text{ lb} \quad \times 0.45$$

$$1 \text{ kPa} = 0.145 \text{ psi} \quad \times 6.895$$

$$= 20.93 \text{ psf} \quad \times 0.048$$

$$1 \text{ kN/m}^3 = 6.261 \text{ pcf} \quad \times 0.157$$

$$= 0.0037 \text{ pci} \quad \times 271.4$$